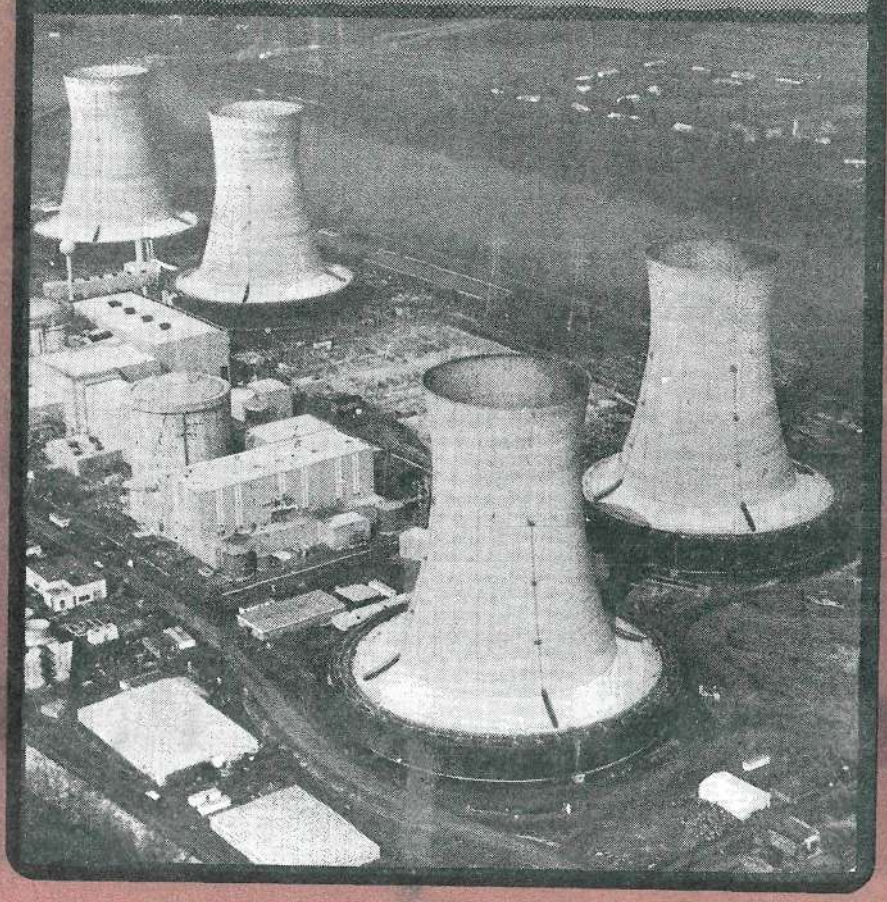
August 1979

$2.00

SoftSide™

"your BASIC software magazine"

MELT DOWN



BUS-80 IS HERE

It costs $100 for the documentation and/or an additional $100 for the software on diskette. We highly recommend subscribing to the complete program - documentation PLUS software.

In adopting this approach, we're going straight for the jugular (so to speak).
We anticipate a very competitive market for business software relating to the TRS-80 within the next year, and wish to establish ourselves immediately in a dominant position. In doing so, we are presuming over 1,000 participants in the BUS-80 project. Pricing accordingly, we truly feel BUS-80 will become such a fantastic bargain that few serious businessmen who intent to use a TRS-80 within their enterprise could possibly pass up the value offered. Really, how could you pass this up?

We're sure you must be interested in just what you'll be getting .
Well, just about everything you need! Within the year, (and probably within six months) you'll receive a disk-based Inventory system - Accounts Receivable system - Accounts Payable system - General Ledger system - Sales - and Payroll.

We're not talking about stripped-down systems
Elements of BUS-80 are already prepared and have been sold individually to satisfied customers for as much as $150. The Name/Address system requires an entire diskette itself (over 50,000 bytes) with some optional subroutines relegated to another supplementary disk.

BUS-80 is not only competitive, it will set the standard by which value is compared. And that standard will be hard to meet.
We would like it understood from the outset that while BUS-80 will deliver a core system for an extremely reasonable price, we'll also be offering other pieces of software for general sale. Usually, BUS-80 participants will be given a discount - in any event, by today's standards, tremendous value will be realized. **The first element of BUS-80 is currently being offered**

THAT'S THE PITCH - BELIEVE IT - IT'S TRUE!

BUS-80

The Business Software People®

17 Briarcliff Drive Milford, NH 03055 **603-673-5144**

SoftSide™

AUGUST 1979

"your BASIC software magazine"

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TSE Market Basket Catalog 66
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For uniformity, we have adopted the Radio Shack TRS-80 Level II BASIC as the BASIC dialect used within the pages of this magazine. It was chosen because it stands to become the most commonly used dialect among microcomputer users and because it shares a common heritage with the many microcomputer languages produced by Microsoft.

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Outgoing Mail

Some straight talk about your first million.

If you are going to make your first million writing a computer program this year, there are overwhelming odds against you. Despite the wild claims that have appeared in other places, great fortunes are not yet available. We have recently been able to verify our suspicion that the TRS-80 Software Exchange is the largest independent supplier of TRS-80 Software. The time has come to drop the hoopla and talk straight.

While others make wild claims of a market of 50,000 to 75,000 buyers for a single game, that is not very likely. Micro Chess has claimed 50,000, but it is available for PET, APPLE, and level I and II TRS-80, and is even sold by Radio Shack. Despite the claim to be the first "Gold Cassette", the honor is clearly held by Radio Shack's Blackjack and Backgammon tape.

Here are the facts, so that you can draw your own conclusions. A few more than 150,000 TRS-80's have been sold. Perhaps 50,000 of these have gone to big business like the oil companies and other locations where game use will not be significant. We suspect that another 30,000 computers are disused and practically forgotten. Perhaps another 5,000 computers serve as second computers for people like myself, our publisher, and several members of the Pittsburgh Computer Club who have more than one TRS-80. Another 5,000 are probably in the hands of mainframe programmers who are using them for machine language programming or dedicated applications. That leaves about 60,000 people to sell to. Only half of them read the magazines, so you would have to sell through Radio Shack to contact the rest. Of the 30,000 left, many would rather die than purchase software. They write, they trade, they share, but they do not buy.

We have a list of 15,000 computer owners that we send the TRS-80 Software Exchange catalogue to. It is an active list, and we have sold to a very high proportion of them. By talking to our programmers, we have discovered that no one but Radio Shack is coming close to the amount of TRS-80 software we are selling. We have quite a number of authors who have also sold programs to Sensational Software (Creative Computing) and Instant Software (Microcomputing). Most of them have sold programs to the others only once, then they came back to us. They came back because they were making more money. I should not complain. Instant Software's full page ad in the July issue for Santa Paravia should do well for me. If they have it long enough and continue to promote it, it may even make more than it made for me in the six months it was sold by the TRS-80 Software Exchange. But the volume of the Software Exchange has tripled since that period.

How much do you make from a program? Most of the names that are familiar to you from our pages are people who are receiving about $300 a month in royalties from us. We do have an author receiving far over $1000 a month in commissions, but most of the regulars are making about $300. They are not making it from a single program, but from several. Most of our programs pay $10 to $100 a month in royalties. For example, my own average monthly income during April and May was $8 for Sink Um, $25 for Pork Barrel, and $102 for X-Wing Fighter; among the nine programs offered. Our sales have increased since then, so the figures may be higher now. But I am in little danger of entering an outrageous tax bracket.

You can have a good part time income, and a couple of our writers have now quit their regular jobs to write full time. If you are interested, here are some hints. Learn to write well, including documentation as well as programs. Become proficient as a programmer. Write regularly, perhaps a good program each month. It will pay to develop a specialty, such as Leo Christopherson's brilliant animation, Scott Adams' adventures, or Lance Micklus' machine language utilities. As for marketing; if you can sell it to Radio Shack, do it. Their percentage is low, but their volume more than makes up for it. If another publisher will guarantee you $5,000, or guarantee to spend several thousand on specific ads for your program, you should do well. Otherwise, you will probably do best with us. We find that even when we carry another company's line of software, we rapidly become their largest customer.

Since the name of the game for a software house is repeat business, we have a lot of reservations about two suppliers. Personal Software and Instant Software are having terrible customer relations problems, mainly with slow delivery. We ordered Time Trek from Personal Software, and after several long distance pleading calls, finally got a small shipment; for the PET! We hope they get their act together, for they have some fine programs, and we like to sell the best. Another way to judge a publisher is to look at their ads. Do they stick to their own magazine or advertise widely? Do they buy full pages or small ads? We have advertised in Byte, Creative Computing, 80-US, Personal Computing and the C.I.E. Newsletter. Byte has done so well for us that we are experimenting with two page ads there.

While we are waving dollar signs in front of your eyes, Softside would like a wider variety of articles. We want something for our readers when they get tired of typing at the keyboard. How about some good general interest articles, reviews, or perhaps some crystal ball gazing? If it is too technical for SoftSide we might still be able to use it in PROG-80.

Now, if you will excuse me, I am going to keep at our feature article while I learn how to singlehandedly shut down a nuclear disaster. After all, I live only a few hours from Three Mile Island, as the wind blows! I used to play and fish there, as a child.

GWB

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KVP runs under DOS or Level II BASIC. It is relocatable under your control, and so may be used simultaneously with other machine language programs.

by Lance Micklus

Here are some of the things you'll be able to do;

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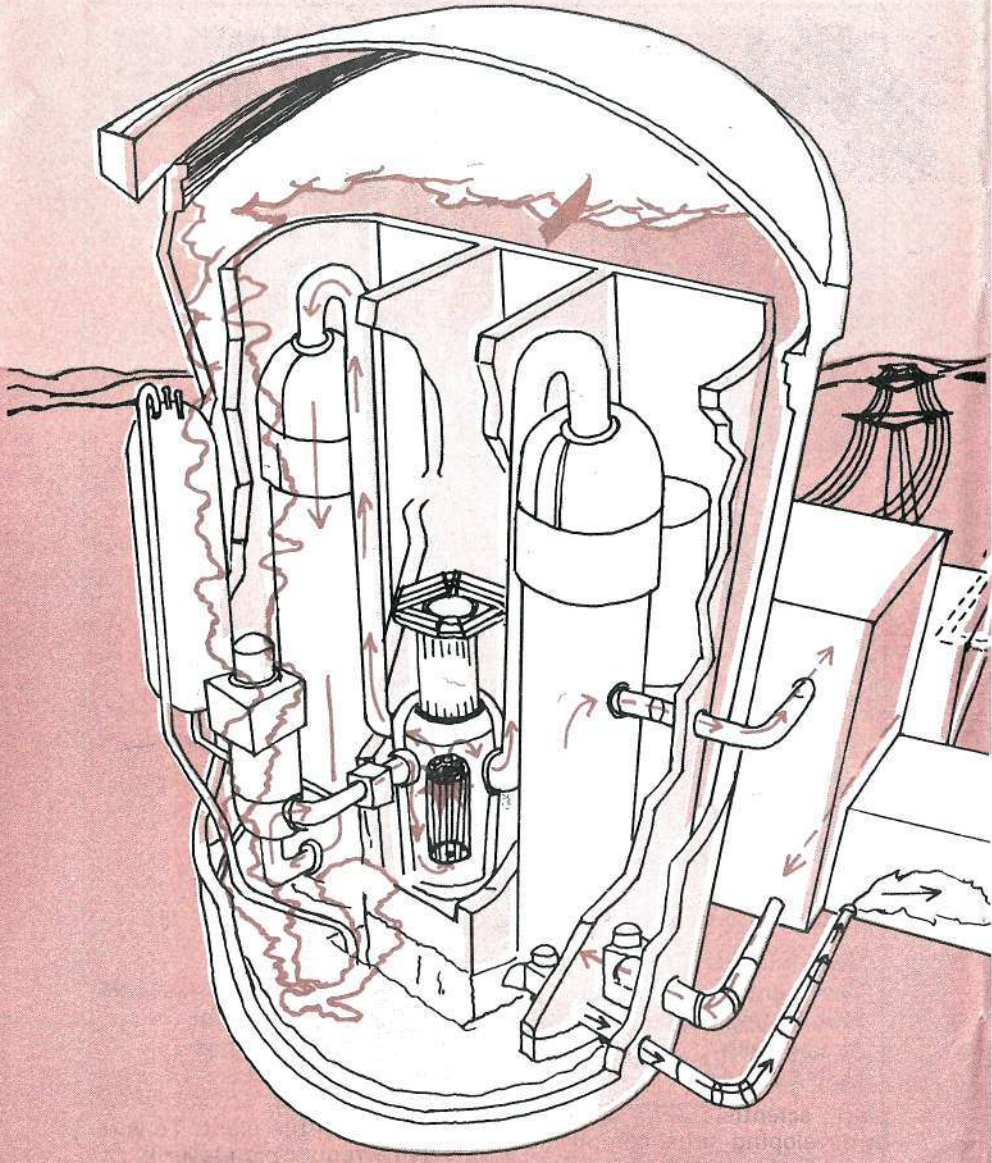


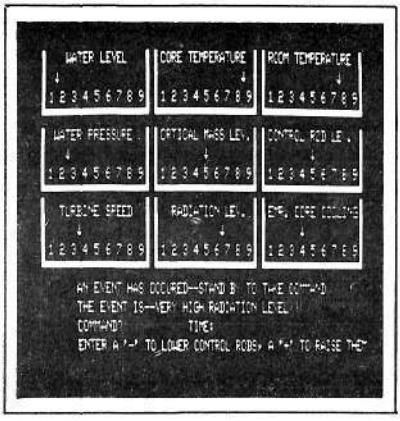
MELT DOWN

Get set to take command! The event: very high critical mass, water pressure low, radiation level getting dangerously high! Every second counts, and if you fail, the grim result will be a massive meltdown, with elimination of all life within a 250-mile radius. Take charge, and good luck!

by Michael Winter

Since their introduction in the 1950's, nuclear power plants have been an important step in man's quest for a cheaper, non-polluting form of energy. But with this new-found energy source came some problems. The first problem was how to safely store highly radioactive substances without releasing radiation - finally solved by means such as thick lead shielding and underground salt mines. The second was how to control the reactor while the reaction was taking place; scientists dealt with that by developing large, complicated power plants with many gauges and computers to help run them. But despite all this technology, nuclear power plants still can have accidents.

In this simulation you get your chance to take command of a nuclear power plant and find out what it is really like. When you first take control you will notice that there are only a few meters - not the assortment of hundreds found in a real plant. Reason: all the back-ups in this "plant" have been eliminated, and the meters you see are of an advanced nature, so you never get a "false reading". At the bottom of the screen will appear a time clock, and a description of the event which is currently taking place in the plant. To win this game requires a player with the ability to look the entire situation over, and determine quickly what steps are necessary to bring the reactor back under control.



To regain control, you must have everything in a stabilized condition - i.e., water pressure must read approximately 5, core temperature must also read approximately 5, etc. The only meter that is excluded from reading as close to 5 as possible is the emergency core cooling level indicator. This meter should read as high as possible. All of the above factors are influenced by your skill level.

At skill Level I the computer will consider any reading above 1 on the emergency core cooling level meter as okay, whereas at level 5 the computer will only consider anything above 5 as acceptable. Also at Level I the computer will accept readings from all the other meters of 3.5 to 7.5, but on level 5 the meters **must** all read exactly 5.

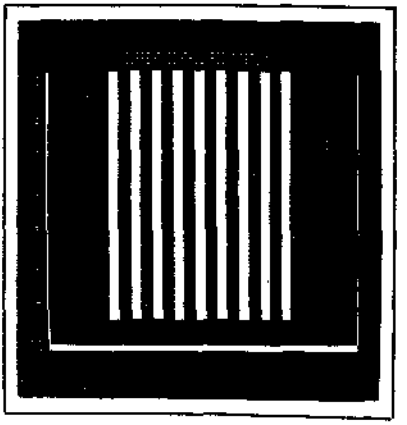
Every three seconds, as noted on the time clock, the computer checks the complete status of the plant, at which point you may find that you have won, or lost. The computer will also check the plant status anytime you hit a key. It is advisable to be careful about which keys you hit, because the wrong key could end the game! Also along with checking the win or loss factor every three seconds, it increments or decrements each meter reading depending upon the event. Changing the control rod level will cause every meter to reflect that change immediately. When the control rods are raised (withdrawn), fission will occur more rapidly, thus increasing the core temperature. Lowering them will have the opposite effect.

When playing this game it is important to understand that not only will each command directly affect the meter it is aimed at, but also the entire reactor. For example, releasing core coolant will of course lower the core temperature, but it will also affect all the other meters because as the core temperature lowers, room temperature drops; less heat is released, the amount of steam decreases and the water pressure will go down; because there is less water pressure the turbine speed will decrease. As you can see, every meter is dependent upon every other, just as in a real plant. The core temperature is the only factor in determining if you have lost, although everything else is affected as explained above. If the core temperature hits 9, you lose. It is also necessary to keep an eye on the water pressure. If it reac reaches 9, the pipes will burst, causing a temporary loss of core cooling. This is similar to what happened in the movie, **"The China Syndrome"**.

This is not the type of game you can win the first time you play. It takes time to develop the

insight and reflexes necessary for victory. The most important thing you will have to learn is what each command affects, how to weigh the advantages and disadvantages, and how to make a logical decision on the best course of action.

When I first set out to write this program I was not at all sure which direction to go in. After seeing **"China Syndrome"** and hearing about Three Mile Island, I decided on a complete working model of a nuclear plant.



The first problem was to determine which meters, out of the vast assortment in an actual plant, were the most important. The meters you see as you take command are there because of their practical value to the program and my feeling that they give the user the most realistic model of an actual plant.

Next, I decided to give the program as much real-time action as possible. To do this I used a flashing cursor and a real time clock. I set up the clock so that every three seconds the plant's complete status was checked. Then I made up a list of all the things I could think of that would go wrong, and put these in a list of data statements, along with the meter readings for each event, and the direction each meter would move when the status was checked. I listed the possible commands, and picked the ones I felt were most realistic. Each command had to interact with the meters; to accomplish this I devised two formulas, in which the input would be a number from 1 to 9, and the output would be the correct screen position to display a given number on a given meter. The only difference between the two formulas is that formula 2 can show any number from 1 to 9 in steps of 0.5, where formula 1. only displays the data in steps of 1. Finally, I wrote the routine to display the control rods.

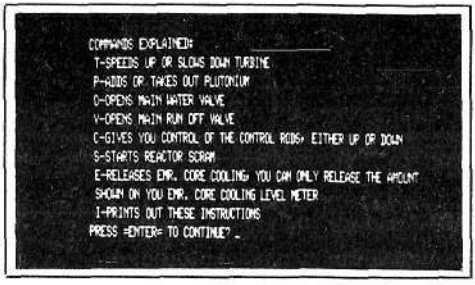
The routine which flashes the cursor is very easy to do, and adds a very nice touch to all real-time programs. With a little extra work the routine could be modified to do anything - from displaying input, to delaying X seconds, and if no input is given, continuing on with the rest of the program. The bar graph routine which displays the control rods could also be modified for use with other programs. Finally, the routine which prints out "You have won" could be used in any other program, and its printing delay time is very simple to adjust.

```
10 REM=====================================
20 REM** NUCLEAR REACTOR * LEVEL II 16K **
30 REM***** WRITTEN BY MICHAEL WINTER *****
40 REM******* NEW CANAAN CT. 06840 *******
50 REM****** VERSION 3.7 ** JUNE 1979 *****
60 REM=====================================
70 REM * SET UP PROGRAM *
80 CLEAR 23: PC=1 : RANDOM
90 CLS : PRINT : PRINT : PRINT
100 PRINT"          * * * NUCLEAR REACTOR TEST * * *"
110 PRINT : PRINT
120 PRINT"  IN THIS SIMULATION YOU ARE THE COMMANDER OF A"
130 PRINT"NUCLEAR POWER PLANT, AND WHILE YOU ARE IN COMMAND"
140 PRINT"RANDOM DISASTERS WILL COME UP AND YOU WILL HAVE TO THE
"
150 PRINT"BEST OF YOUR ABILITY TRY TO GET THE PLANT BACK UNDER"
160 PRINT"CONTROL, IF YOU FAIL YOU WILL EXPERIENCE A MASSIVE MEL
T-"
170 PRINT"DOWN WHICH WILL CAUSE THE ELIMINATION OF ALL LIFE WITH
IN"
180 PRINT"A 250 MILE RADIUS OF THE PLANT.  THE COMPUTER WILL TAKE
"
190 PRINT"YOUR SKILL LEVEL INTO CONSIDERATION WHEN IT IS TESTING
"
200 PRINT"TO SEE IF YOU HAVE WON, TO WIN YOU MUST HAVE ALL THE"
210 PC=1
220 INPUT"PRESS =ENTER= TO CONTINUE";D$
230 CLS : PRINT : PRINT : PRINT
240 PRINT"METERS READING AS CLOSE TO 5 AS POSSIBLE, WITH THE"
250 PRINT"EXCEPTION OF THE RADIATION LEVEL METER, AND THE EMERGE
NCY"
260 PRINT"CORE COOLING LEVEL METER, THE COMPUTER WILL CONSIDER,"
270 PRINT"DEPENDING ON YOUR SKILL LEVEL, ANY READING ON THE RADI
RTION"
280 PRINT"LEVEL METER BELOW 2 AS SAFE, AND ANY READING ON THE"
290 PRINT"EMR.  CORE COOLING METER ABOVE 2 AS SAFE.  THE COMPUTER"
"
300 PRINT"WILL TIME YOU, AND AS IN A REAL PLANT, YOU WILL HAVE"
310 PRINT"TO REACT QUICKLY TO AVOID A MELT DOWN! ALSO EACH COMMAN
D"
```

```
320 PRINT"HAS ITS ADVANTAGES, AND ITS DISADVANTAGES, YOU WILL HA
VE"
330 PRINT"TO WEIGH THE TWO AND MAKE A LOGICAL DESCION, TO HELP"
340 PRINT"YOU HERE IS A PARTIAL LIST OF THE COMANDS, THEIR"
350 PRINT"ADVANTAGES, AND DISADVANTAGES:"
360 INPUT"PRESS =ENTER= TO CONTINUE";D$
370 CLS : PRINT : PRINT : PRINT
380 PRINT"COMMAND  ADVANTAGE                DISADVANTAGE"
390 PRINT"   O     COOLS CORE               RAISES WATER PRESSURE",
400 PRINT"   V     LOWERS WATER PRESSURE    RAISES CORE TEMP
410 PRINT"   S     LOWERS CORE TEMP.        STOPS TURBINE"
420 PRINT" ↓ C     SPEEDS UP TURBINE        RAISES CORE TEMP"
430 PRINT" "; CHR$(92);" ";"C     LOWERS CORE TEMP.      LOWERS T
URBINE SPEED"
440 PRINT"   E     LOWERS CORE TEMP         LOWERS EMERGENCY CORE C
OOLING"
450 PRINT"  +P     RAISES CRITICAL MASS     LOWERS TURBINE SPEED"
460 PRINT"  -P     LOWERS CRITICAL MASS     RAISES CORE TEMP
470 PRINT"  +T     SPEEDS UP TURBINE        RAISES CORE TEMP. "
480 PRINT"  -T     SLOWS DOWN TURBINE       RAISES WATER PRESSURE"
490 INPUT"PRESS =ENTER= TO CONTINUE";D$
500 CLS : PRINT : PRINT : PRINT
510 PRINT"COMMANDS EXPLAINED:"
520 PRINT" T-SPEEDS UP OR SLOWS DOWN TURBINE"
530 PRINT" P-ADDS OR TAKES OUT PLUTONIUM"
540 PRINT" O-OPENS MAIN WATER VALVE"
550 PRINT" V-OPENS MAIN RUN OFF VALVE"
560 PRINT" C-GIVES YOU CONTROL OF THE CONTROL RODS, EITHER UP OR
 DOWN"
570 PRINT" S-STARTS REACTOR SCRAM"
580 PRINT" E-RELEASES EMR. CORE COOLING, YOU CAN ONLY RELEASE TH
E AMOUNT   SHOWN ON YOU EMR. CORE COOLING LEVEL METER
 I-PRINTS OUT THESE INSTRUCTIONS"
590 INPUT"PRESS =ENTER= TO CONTINUE";D$ : IF SG=2 THEN RETURN
600 PRINT"WHAT LEVEL OF PLAY -1-NOVICE, -2-EASY, -3-HARD"
610 INPUT"-4-VERY HARD, -5-EXPERT";LV
620 IF LV=5 THEN BN=10 : EN=10 : RD=1 ELSE IF LV=4 THEN BN=9 : E
N=11 : RD=2 ELSE IF LV=3 THEN BN=8 : EN=12 : RD=3 ELSE IF LV=2 T
HEN BN=7 : EN=13 : RD=4 ELSE IF LV=1 THEN BN=6 : EN=14 : RD=5 EL
```

```
SE PRINT"INVALID-- TRY AGAIN!!" : GOTO 600
630 REM * DRAW METER BOXES *
640 CLS
650 FOR S=0 TO 8 : SET(2,S) : SET(39,S) : SET(42,S) : SET(79,S)
: SET(82,S) : SET(119,S) : NEXT S
660 FOR S=12 TO 20 : SET(2,S) : SET(39,S) : SET(42,S) : SET(79,S
) : SET(82,S) : SET(119,S) : NEXT S
670 FOR S=23 TO 32 : SET(2,S) : SET(39,S) : SET(42,S) : SET(79,S
) : SET(82,S) : SET(119,S) : NEXT S
680 FOR S=2 TO 39 : SET(S,9) : SET(S,21) : SET(S,33) : NEXT S :
FOR S=42 TO 79 : SET(S,9) : SET(S,21) : SET(S,33) : NEXT S : FOR
 S=82 TO 119 : SET(S,9) : SET(S,21) : SET(S,33) : NEXT S
690 REM * LABLE METERS *
700 PRINT @ 5,"WATER LEVEL"; : PRINT @ 22,"CORE TEMPERATURE"; :
PRINT @ 42,"ROOM TEMPERATURE";
710 PRINT @ 259,"WATER PRESSURE"; : PRINT @ 278,"CRTICAL MASS L
EV."; : PRINT @ 298,"CONTROL ROD LEV.";
720 PRINT @ 516,"TURBINE SPEED"; : PRINT @ 535," RADIATION LEV."
; : PRINT @ 554,"EMR. CORE COOLING";
730 REM * PRINT SCALES IN EACH METER *
740 FOR P1=130 TO 170 STEP 20 : PRINT @ P1,"1 2 3 4 5 6 7 8 9";
: NEXT P1
750 FOR P1=386 TO 426 STEP 20 : PRINT @ P1,"1 2 3 4 5 6 7 8 9";
: NEXT P1
760 FOR P1=642 TO 682 STEP 20 : PRINT @ P1,"1 2 3 4 5 6 7 8 9";
: NEXT P1
770 REM * IF COMING FROM PROGRAM RETURN *
780 IF GS=1 THEN RETURN
790 REM * GET A RANDOM DISASTER *
800 RESTORE : DA=RND(16)
810 FOR X=1 TO DA
820 READ D$,D1,D2,D3,D4,D5,D6,D7,D8,D9,I1,I2,I3,I4,I5,I6,I7,I8,I
9
830 NEXT X
840 GOTO 950
850 REM * INCREMENT EACH METER *
860 D1=D1+I1 : D2=D2+I2 : D3=D3+I3 : D4=D4+I4 : D5=D5+I5 :
    D6=D6+I6 : D7=D7+I7 : D8=D8+I8 : D9=D9
870 IF D7 > D4 THEN D7=D4+2 ELSE IF D7 < D4-2 THEN D7=D4-2
```

```
880 IF TM <= 1 THEN ZX=D6 ELSE ZX=INT(D6/2)
890 IF ZX=5 THEN 930 : REM  * GIVE A REALISTIC METER LEVEL
DEPENDENT UPON CONTROL ROD LEVEL *
900 IF ZX=1 THEN D1=D1+8 : D2=D2+6 : D4=D4+8 : D7=D7+8 ELSE IF Z
X=2 THEN D1=D1+6 : D2=D2+4 : D4=D4+6 : D7=D7+6 ELSE IF ZX=3 THEN
 D1=D1+4 : D2=D2+3 : D4=D4+4 : D7=D7+4 ELSE IF ZX=4 THEN D1=D1+2
 : D2=D2+2 : D4=D4+2 : D7=D7+2
910 IF ZX=6 THEN D1=D1-2 : D2=D2-2 : D4=D4-2 : D7=D7-2 ELSE IF Z
X=7 THEN D1=D1-4 : D2=D2-4 : D4=D4-4 : D7=D7-4 ELSE IF ZX=8 THEN
 D1=D1-6 : D2=D2-5 : D4=D4-6 : D7=D7-6  ELSE IF ZX=9 THEN D1=D1-
8 : D2=D2-6 : D4=D4-8 : D7=D7-8
920 D3=D2-2 : D8=D2-4 : D9=D9-2
930 IF PC=1 THEN PC=2 : GOTO 1060 ELSE GOTO 1080
940 REM * FORMULA TO COMPUTE SCREEN POS. FOR EACH METER *
950 MP=64+D1*2
960 M2=84+D2*2
970 M3=104+D3*2
980 M4=320+D4*2
990 M5=340+D5*2
1000 M6=360+D6*2
1010 M7=576+D7*2
1020 M8=596+D8*2
1030 M9=616+D9*2
1040 GOTO 1450
```




```
1050 REM * IF FIRST PASS ON NEW FORMULA THEN CONVERT OLD SCREEN
POSITIONS TO THE NEW FORMULA *
1060 D1=D1*2 : D2=D2*2 : D3=D3*2 : D4=D4*2 : D5=D5*2 :
    D6=D6*2 : D7=D7*2 : D8=D8*2 : D9=D9*2
1070 REM * CORE TEMP. TOO HIGH? IF SO YOU LOSE *
1080 IF M2=102 THEN 3220
1090 REM * REACTOR STABLE? IF SO YOU WIN!! *
1100 IF M7=594 THEN D7=0 : I7=0 : D1=0 : I1=0 : D2=9 : I2=1 : D3
=8 : I3=1 : D4=0 : I4=0 : I5=0 : D8=8 : I8=1 : D9=0 : I9=0
1110 IF TM > 5 AND D1 >=BN AND D1 <=EN AND D2 >=BN AND D2 <=EN A
ND D3 >=BN AND D3 <=EN AND D4 >=BN AND D4 <=EN AND D5 >=BN AND D
5 <=EN AND D6 >=BN AND D6 <=EN AND D7 >=BN AND D7 <=EN AND D8 <=
RD AND D9 >=BN-6 THEN 3380
1120 REM * ERASE OLD METER READINGS FOR NEW ONES *
1130 PRINT @ MP," "; : PRINT @ M2," "; : PRINT @ M3," "; :
```

HARDWARE

THE HARDSIDE™ OF SOFTSIDE ?

NEW! TRS-80 Computers 10% off!

Effective July 1, Radio Shack dropped the price of TRS-80 equipment. On the same date, we received authorization to sell the complete TRS-80 line, at 10% below the new low Radio Shack price. This all new equipment, with Radio Shack warranty and service, is now made more affordable than ever!

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So . . . if you're looking to buy or sell TRS-80 equipment, look to us first!

	NEW		USED	
UNIT	NEW R/S LIST PRICE	HARDSIDE DISCOUNT PRICE	WE'LL PAY	SELL
Level I 4K	$499	$449	$300	$375
Level II 4K	$619	$557	$375	$475
Level I 16K	$729	$656	$375	$475
Level II 16K	$849	$764	$500	$650
Level II 16K no keypad			$450	$600
Expansion Interface				
.....OK	$299	$269	$175	$225
.....16K	$448	$403	$225	$300
.....32K	$597	$537	$275	$375
Disk Drives 0	$499	$449	$300	$399
1	$499	$449	$275	$375
(Percom disk drives	-	$399	-	-
Printers Friction feed*	$1299	$1169	$650	$800
Tractor Feed*	$1559	$1403	$750	$900
Line PrinterII	$999	$899	New Item Not available	
Quick Printer I*	$499	$449	$250	$325
Quick Printer II	$219	$197	$125	$175
*(Requires cable	$40	$36)		
RS-232C	$99	$89	$50	$75
Telephone Int. I	Discontinued		$50	$75
Telephone Int II	$199	$179	$100	$150
16K Memory	**$149**	**$99**		

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HEADQUARTERS

EXIDY SORCERER

Until recently, you couldn't buy a microcomputer with the power and features of the Exidy Sorcerer. Now, an 8K RAM, 12K ROM Sorcerer is only $995.00. Advanced features include built-in monitor in ROM (including memory and video tests), ultra-high resolution graphics (512 x 240), upper/lower case, user-definable character set, and 1200 band cassette I/O. Plus, 64 x 30 video (displays twice as much text as TRS-80), built in RS-232, parallel port, and the most complete keyboard of any microcomputer on the market. And, best of all, the Sorcerer is compatible with both CP/M and the S-100 bus for unlimited software and hardware expansion. Take a step up to Sorcerer power today!

PRICE LIST

Sorcerer Computer — 8K RAM		**$995**
	16K RAM	**$1145**
	32K RAM	**$1295**
	48K RAM	**$1445**
ROM Software Cartridges -		
	Word Processor	**$99**
	Editor/Assembler	**$99**
	BASIC [Included free with computer]	**$99**
Hardware Expansion		
	S-100 Expansion Unit	**$349**
	S-100 I/O Expansion Kit	**$199**
LEEDEX Video 100 monitor		**$139.95**

(The Sorcerer requires a video monitor or connection to a TV through an RF modulator.)

HARDSIDE™ Your market for new and used microcomputer equipment.

17 Briarcliff Drive **Milford, New Hampshire 03055**

```
    PRINT @ M4," "; : PRINT @ M5," "; : PRINT @ M6," "; :
    PRINT @ M7," "; : PRINT @ M8," "; : PRINT @ M9," ";
1140 REM * NEW FORMULA FOR CALCULATING SCREEN POSTIONS,
ALLOWS FOR MORE ACCURATE READINGS OF 1-9 IN INCREMENTS OF .5 *
1150 MP=64+D1 : M2=84+D2 : M3=104+D3 : M4=320+D4 : M5=340+D5 :
    M6=360+D6 : M7=576+D7 : M8=596+D8 : M9=616+D9
1160 REM * CHECK FOR TOO HIGH OR TOO LOW READINGS *
1170 IF MP < 66 THEN MP=66
1180 IF MP > 82 THEN MP=82
1190 IF M2 < 86 THEN M2=86
1200 IF M2 > 102 THEN M2=102
1210 IF M3 < 106 THEN M3=106
1220 IF M3 > 122 THEN M3=122
1230 IF M4 < 322 THEN M4=322
1240 IF M4 > 338 THEN M4=338
1250 IF M5 < 342 THEN M5=342
1260 IF M5 > 358 THEN M5=358
1270 IF M6 < 362 THEN M5=362
1280 IF M6 > 378 THEN M6=378
1290 IF M7 < 578 THEN M7=578
1300 IF M7 > 594 THEN M7=594
1310 IF M8 < 598 THEN M8=598
1320 IF M8 > 614 THEN M8=614
1330 IF M9 < 618 THEN M9=618
1340 IF M9 > 634 THEN M9=634
1350 IF D1<0 THEN D1=-2
1360 IF D2<0 THEN D2=-2
1370 IF D3<0 THEN D3=-2
1380 IF D4<0 THEN D4=-2
1390 IF D5<0 THEN D5=-2
1400 IF D6<0 THEN D6=-2
1410 IF D7<0 THEN D7=-2
1420 IF D8<0 THEN D8=-2
1430 IF D9<0 THEN D9=-2
1440 REM * DISPLAY NEW METER READINGS *
1450 PRINT @ MP,CHR$(92); : PRINT @ M2,CHR$(92); : PRINT @ M3,CH
R$(92);
1460 PRINT @ M4,CHR$(92); : PRINT @ M5,CHR$(92); : PRINT @ M6,CH
R$(92);
```

```
1470 PRINT @ M7,CHR$(92); : PRINT @ M8,CHR$(92); : PRINT @ M9,CH
R$(92);
1480 PRINT @ 775,"AN EVENT HAS OCCURED--STAND BY TO TAKE COMMAND
";
1490 REM * DISPLAY PROBLEM *
1500 PRINT @ 839,"THE EVENT IS--";D$;
1510 PRINT @ 903,"COMMAND?"; : PRINT @ 923,"TIME:";TM;
1520 REM * REAL TIME CLOCK, EVERY 3 SECONDS METERS CHANGE *
1530 TM=TM+1 : MM=MM+1 : IF MM > 3 OR MM=1 AND PC=1 THEN MM=0 :
MX=MX+1 : GOTO 860
1540 IF MX >=2 THEN MX=0  : D9=D9+4 : IF D9 >=17 THEN D9=16
1550 REM * * FLASHING CURSOR * *
1560 PRINT @ 911,CHR$(14); : FOR TD=1 TO 42 : NEXT TD : PRINT @
911,CHR$(15); : FOR TD=1 TO 23 : NEXT TD : PRINT @ 911,CHR$(14);
 : FOR TD=1 TO 42 : NEXT TD : PRINT @ 911,CHR$(15); : FOR TD=1 T
O 23 : NEXT TD : PRINT @ 928,"       ";
1570 REM * KEY PRESSED? IF SO GO TO COMMAND SUBROUTINE *
1580 CM$=INKEY$ : IF CM$="" THEN 1510
1590 GOSUB 1790
1600 GOTO 860
1610 REM * DISASTER DATA *
1620 DATA "WATER LEVEL LOW!",3,7,6,4,5,5,4,2,4,-1,1,1,-1,0,0,-1,
-1,-1
1630 DATA "WATER PRESSURE LOW!",4,7,6,3,5,5,3,2,4,-1,1,1,-1,0,0,
-1,1,-1
1640 DATA "LOW CRITICAL MASS!",5,7,6,5,3,5,6,3,5,0,1,1,0,-1,0,1,
1,0
1650 DATA "HIGH CRITICAL MASS!",5,3,4,5,7,5,4,1,5,0,-1,-1,0,1,0,
-1,0,0
1660 DATA "WATER PRESSURE HIGH!",6,5,5,7,4,5,7,1,6,1,0,0,1,0,0,1
,0,1
1670 DATA "WATER LEVEL VERY LOW!!",2,8,7,3,5,5,3,4,3,-1,1,1,-1,0
,0,-1,1,-1
1680 DATA "WATER PRESSURE VERY LOW!!",3,8,7,3,5,5,2,4,4,-1,1,1,-
1,0,0,-1,1,-1
1690 DATA "VERY HIGH CRITICAL MASS!!",5,2,3,5,8,5,3,1,5,0,-1,-1,
0,1,0,-1,0,0
1700 DATA "VERY LOW CRITICAL MASS!!",5,8,7,5,2,5,7,4,5,0,1,1,0,-
1,0,1,1,0
```

```
1710 DATA "EMR. CORE COOLING FAILURE",3,7,6,4,5,5,4,2,1,-1,1,1,-
1,0,0,-1,1,-1
1720 DATA "PUMP POWER FAILURE",4,7,6,2,5,5,1,2,4,-1,1,1,-1,0,0,-
1,-1,-1
1730 DATA "VERY HIGH RADIATION LEVEL!!",3,7,6,4,5,5,6,5,4,-1,1,1
,-1,0,0,1,1,-1
1740 DATA "VERY HIGH RADIATION LEVEL!!",2,8,7,3,5,5,7,6,3,-1,1,1
,-1,0,0,1,1,-1
1750 DATA "HIGH TURBINE SPEED!",6,4,4,7,5,5,7,1,6,1,0,0,1,0,0,1,
0,1
1760 DATA "VERY HIGH TURBINE SPEED!!",6,4,4,8,5,5,8,1,6,1,0,0,1,
0,0,1,0,1
1770 DATA "WATER PUMP FAILURE!",4,7,6,1,5,5,1,3,4,-1,1,1,0,0,0,0,
1,-1
1780 REM * COMMAND SUBROUTINE *
1790 IF CM$="V"THEN 1890
1800 IF CM$="C"THEN 2010
1810 IF CM$="E"THEN 2480
1820 IF CM$="P"THEN 2600
1830 IF CM$="S"THEN 2850
1840 IF CM$="O"THEN 2970
1850 IF CM$="T"THEN 3080.
1860 IF CM$="I" THEN 3200
1870 RETURN
```

```
COMMAND  ADVANTAGE              DISADVANTAGE
  C      COOLS CORE             RAISES WATER PRESSURE
  V      LOWERS WATER PRESSURE  RAISES CORE TEMP
  S      LOWERS CORE TEMP.      STOPS TURBINE
 ↑ C     SPEEDS UP TURBINE      RAISES CORE TEMP
 ↓ C     LOWERS CORE TEMP.      LOWERS TURBINE SPEED
  E      LOWERS CORE TEMP       LOWERS EMERGENCY CORE COOLING
 +P      RAISES CRITICAL MASS   LOWERS TURBINE SPEED
 -P      LOWERS CRITICAL MASS   RAISES CORE TEMP
 +T      SPEEDS UP TURBINE      RAISES CORE TEMP.
 -T      SLOWS DOWN TURBINE     RAISES WATER PRESSURE
PRESS <ENTER> TO CONTINUE
```

```
1880 REM * LET OUT WATER, COMMAND 'V' *
1890 PRINT @ 967,"HOW FAR WOULD YOU LIKE TO OPEN YOUR RUN OFF VA
LVE (2-8)?"; : W1$=INKEY$ : IF W1$="" THEN 1890 ELSE W1=VAL(W1$)
1900 IF W1 > 8 OR W1 < 2 THEN PRINT @ 967,"INVALID!!
                                        "; : FOR DL=1 TO 1000 : NEXT
DL : GOTO 1890
1910 REM * ADJUST ALL METERS IN PROPORTION TO HOW FAR
VALVE IS OPEN *
1920 D1=D1-MI
1930 D2=INT(D2+MI/3)
1940 D3=D2-1
1950 D4=D1-1
1960 D7=INT(D7-MI/3)
1970 D8=INT(D8+MI/4)
1980 D9=INT(D9-MI/3)
```

```
1990 RETURN
2000 REM * RAISE OR LOWER CONTROL RODS, COMMAND 'C' *
2010 PRINT @ 967,"ENTER A '-' TO LOWER CONTROL RODS, A '+' TO RA
ISE THEM  "; : DF$=INKEY$ : IF DF$="" THEN 2010
2020 PRINT @ 967,"ENTER AMOUNT YOU WOULD LIKE TO RAISE OR LOWER
THEM      ";
2030 FD$=INKEY$ : IF FD$="" THEN 2030 ELSE CR$=DF$+FD$ : CR=VAL(
CR$)
2040 REM * IF A '-' ENTERED THEN GOTO TO ROUTINE TO LOWER
THEM *
2050 IF SGN(CR)=-1 THEN 2150
2060 REM * ADJUST METERS *
2070 D6=D6-CR*2
2080 D2=INT(D2+CR)
2090 D3=D2-1
2100 D4=D4+CR*2
2110 D7=D7+CR*2
2120 D8=INT(D8+CR)
2130 GOTO 2220
2140 REM * ADJUST METERS FOR LOWERING THEM *
2150 D6=D6+ABS(CR*2)
2160 D2=INT(D2-ABS(CR))
2170 D3=D2+1
2180 D4=D4-ABS(CR)*2
2190 D7=D7-ABS(CR)*2
2200 D8=INT(D8-ABS(CR))
2210 REM * GRAPHICALLY DISPLAY CONTROL ROD POSTIONS *
2220 CLS : PRINT TAB(17)"CURRENT CONTROL ROD POSTIONS";
2230 FOR Y=3 TO 46 : SET(6,Y) : SET(121,Y) : NEXT Y
2240 FOR X=6 TO 121 : SET(X,46) : NEXT X
2250 SC=0 : PR=0
2260 FOR DS=64 TO 960 STEP 128 : SC=SC+1 : PRINT @ DS,SC; : NEXT
 DS
2270 IF D6/2 < 0 THEN D6=0
2280 IF D6/2 > 9 THEN  D6=18
2290 ON D6/2 GOTO 2300,2310,2320,2330,2340,2350,2360,2370,2380
2300 MS=0 : GOTO 2390
2310 MS=2 : GOTO 2390
2320 MS=4 : GOTO 2390
```

```
2330 MS=6 : GOTO 2390
2340 MS=8 : GOTO 2390
2350 MS=10 : GOTO 2390
2360 MS=12 : GOTO 2390
2370 MS=14 : GOTO 2390
2380 MS=14 : GOTO 2390
2390 BL$=CHR$(191)
2400 REM * DRAW CONTROL RODS *
2410 FOR RP=0 TO MS : PR=PR+64 : IF RP=0 THEN PR=PR-64
2420 PRINT @ 78+PR,BL$; : PRINT @ 79+PR,BL$; : PRINT @ 82+PR,BL$
; : PRINT @ 83+PR,BL$; : PRINT @ 86+PR,BL$; : PRINT @ 87+PR,BL$;
 : PRINT @ 90+PR,BL$; : PRINT @ 91+PR,BL$; : PRINT @ 94+PR,BL$;
: PRINT @ 95+PR,BL$;
2430 PRINT @ 98+PR,BL$; : PRINT @ 99+PR,BL$; : PRINT @ 102+PR,BL
$; : PRINT @ 103+PR,BL$; : PRINT @ 106+PR,BL$; : PRINT @ 107+PR,
BL$; : PRINT @ 110+PR,BL$; : PRINT @ 111+PR,BL$; : NEXT RP
2440 FOR DL=1 TO 1234 : NEXT  DL
2450 Y$="" : IF D6/2 > 9 THEN D6=18 ELSE IF D6/2 < 1 THEN D6=2
2460 GS=1 : GOSUB 640 : RETURN
2470 REM * CORE COOLINE, COMMAND 'E' *
2480 PRINT @ 967,"HOW MUCH COOLANT WOULD YOU LIKE TO ENTER THE C
ORE?      "; : CL$=INKEY$ : IF CL$="" THEN 2480 ELSE CL=VAL(CL$)
2490 IF D9-CL (=0 THEN PRINT @ 967,"YOU DON'T HAVE ENOUGH COOLAN
T                    "; : FOR DL=1 TO 1000 : NEXT DL : GOTO 24
80
2500 REM * ADJUST METERS *
2510 D9=D9-CL
2520 D1=D1+3
2530 D2=INT(D2-CL/2)
2540 D3=D2-2
2550 D4=D1-1
2560 D7=INT(D7+CL/3)
2570 D8=INT(D8-D2/2)
2580 RETURN
2590 REM * ADD OR REMOVE FUEL, USED TO ADJUST CRITICAL MASS,
 COMMAND 'P' *
2600 PRINT @ 967,"HOW MANY FUEL UNITS WOULD YOU LIKE TO REMOVE,
OR ENTER  "; : FOR DL=1 TO 232 : NEXT DL
2610 PRINT @ 967,"ENTER A '-' TO REMOVE FUEL, AND A '+' TO ADD F
```

```
UEL       "; : FOR DL=1 TO 232 : NEXT DL
2620 PRINT @ 967,"EACH UNIT WILL INCREASE OR DECREASE CRITICAL M
ASS BY 1/2"; : FOR DL=1 TO 232 : NEXT DL
2630 PRINT @ 967,"ENTER THE SIGN, THEN THE #- (1-9)
          "; : XC$=INKEY$ : IF XC$="" THEN 2630
2640 CX$=INKEY$ : IF CX$="" THEN 2640 ELSE UR$=XC$+CX$ : UR=VAL(
UR$)
2650 REM * IF '-' GOTO ROUTINE TO REMOVE FUEL *
2660 IF SGN(UR)=-1 THEN 2770
2670 REM * TEST FOR TO MUCH ADDED *
2680 IF INT(D5+UR/2) > 17 THEN PRINT @ 967,"YOU CAN'T ENTER THAT
 MUCH                                  "; : FOR DL=1 TO 1000 : NEXT
 DL : GOTO 2600
2690 REM * ADJUST METERS *
2700 D5=INT(D5+UR/2)
2710 D2=INT(D2-UR/2)
2720 D3=D2-2
2730 D4=INT(D4-UR/2)
2740 D7=INT(D7-UR/2)
2750 D8=INT(D2/2)
2760 RETURN
2770 D5=INT(D5-ABS(UR))
2780 D2=INT(D2-ABS(UR))
2790 D3=D2-2
2800 D4=INT(D4-ABS(UR))
2810 D7=INT(D7-ABS(UR))
2820 D8=INT(D2/2)
2830 RETURN
2840 REM * LOWER CONTROL RODS - SCRAM, COMMAND 'S' *
2850 PRINT @ 967,"VERIFY REACTOR SCRAM?
          "; : VR$=INKEY$ : IF VR$="" THEN 2850 ELSE IF VR$ <> "
Y" THEN RETURN
2860 REM * ADJUST METERS *
2870 D1=D1+1
2880 D2=D2-5
2890 D3=D3-4
2900 D4=D4+3
2910 D6=18
2920 D7=D7+3
2930 D8=INT(D8-D2/2)
```

```
2940 D9=D9+1
2950 RETURN
2960 REM * FLOOD CORE WITH WATER, COMMAND 'O' *
2970 PRINT @ 967,"HOW MUCH WATER WOULD YOU LIKE TO IN THE CORE (
1-9)?    "; : MV$=INKEY$ : IF MV$="" THEN 2970 ELSE MV=VAL(MV$)
2980 REM * ADJUST METERS *
2990 D1=INT(D1+MV/2)
3000 D2=INT(D2-MV/3)
3010 D3=D2-2
3020 D4=D1-2
3030 D7=INT(D4/2)+2
3040 D8=INT(D2/2)
3050 D9=INT(D9+MV/3)
3060 RETURN
3070 REM * CHANGE TURBINES SPEED, COMMAND 'T' *
3080 PRINT @ 962,"WHAT % OF TOTAL TURBINEE SPEED WOULD YOU LIKE
9=90% ...."; : TS$=INKEY$ : IF TS$="" THEN 3080 ELSE TS=VAL(TS$)
3090 REM * ADJUST METERS *
3100 TT=TS*.01
3110 D7=INT(D7*TT)
3120 D1=D4-3
3130 IF D4 <10 THEN D2=D2+4 ELSE D2=D2-4
3140 D3=D2-3
3150 D4=INT(D4+TT/2)
3160 D8=INT(D2/2)
3170 D9=D9+3
3180 PRINT @ 962,"      "; : RETURN
3190 REM * PRINT INSTRUCTIONS, COMMAND 'I' *
3200 CLS : PRINT : PRINT : SG=2 : GOSUB 370 : GS=1 : GOSUB 640 :
 RETURN
3210 REM * YOU LOSE *
3220 CLS : PRINT : PRINT : PRINT CHR$(23)
3230 PRINT : PRINT : PRINT : PRINT
3240 PRINT" DANGER - DANGER - DANGER"
3250 FOR X=1 TO 3232 : NEXT X
3260 CLS : PRINT : PRINT : PRINT
3270 PRINT"  THE REACTOR TEMPERATURE HAS REACHED AN UNCONTROLLAB
LE POINT-"
3280 PRINT"YOU HAVE FAILED YOUR MISSION -- STAND BY --"
```

```
3290 PRINT"I, THE TRS-80 COMPUTER SYSTEM, AM NOW STARTING THE"
3300 PRINT"NUCLEAR DISASTOR LOG -- YOU HAVE APROXIMENTALLY"
3310 PRINT"3 1/2 HOURS TO CLEAR ALL PEOPLE WITHIN A 200 MILE"
3320 PRINT"RADIUS OF THIS PLANT BEFORE THE CORE COMPLETELY"
3330 PRINT"MELTS THROUGH THE REACTOR CORE BUILDING AND CAUSES"
3340 PRINT"A MASSIVE RELEASE OF RADIATION -- SO LONG, GOOD BY --"
3350 PRINT"    BY THE WAY -- YOUR FIRED! * * * * *"
3360 INPUT"WOULD YOU LIKE TO PLAY AGAIN";PL$ : IF LEFT$(PL$,1)="
Y" THEN RUN 60 ELSE 3490
3370 REM * YOU WIN *
3380 CLS : PRINT : PRINT : PRINT
3390 A$="EVENT OVER-- EVENT DURATION:"
3400 X=1 : TM$=STR$(TM)
3410 B$=MID$(A$,X,1) : PRINT B$; : FOR DL=1 TO 32 : NEXT DL : X=
X+1 : IF X < 29 THEN 3410 ELSE FOR T=1 TO LEN(TM$) : T2$=MID$(TM
$,T,1) : PRINT T2$; : FOR DL=1 TO 57 : NEXT DL : NEXT T : PRINT
: PRINT
3420 FOR Y=0 TO 72 : SET(Y,12) : FOR DL=1 TO 23 : NEXT DL : NEXT
 Y
3430 FOR DL=1 TO 323 : NEXT DL
3440 PRINT"  YOU HAVE DONE IT!! THE REACTOR IS UNDER CONTROL!"
3450 PRINT"AND IT ONLY TOOK YOU";TM;"SECONDS - GOOD WORK!"
3460 PRINT"I AM GOING TO HAVE A TALK WITH THE NUCLEAR REGULATORY
"
3470 PRINT"COMMISSION ABOUT A CHRISTMAS BONUS FOR YOU!!, YOU DES
ERVE"
3480 PRINT"IT!! SO LONG, GOOD BYE!!" : INPUT"WOULD YOU LIKE TO P
LAY AGAIN";PL$ : IF LEFT$(PL$,1)="Y" THEN RUN 60
3490 END
```


Histograph/Scattergram

by Gary S. Breschini

Histograph constructs a five- to fourteen-element bar graph. User specifies the range of data and number of bars in graph; program sets upper and lower response limits for each bar element. Graph composed in "real time" as data is entered.

Scattergram plots XY information for visual analysis of trends. Extensive documentation.

Level II, 16K.....$9.95

TRS-80 Software Exchange

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REWARD

$50

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Reward for the capture, dead or alive, of any and all members of the notorious "Badlands Gang". Wanted for stagecoach holdup, train robbery and shooting three clowns, four ducks, and a flying arrow APPROACH WITH CAUTION!

WANTED: DEAD OR ALIVE!

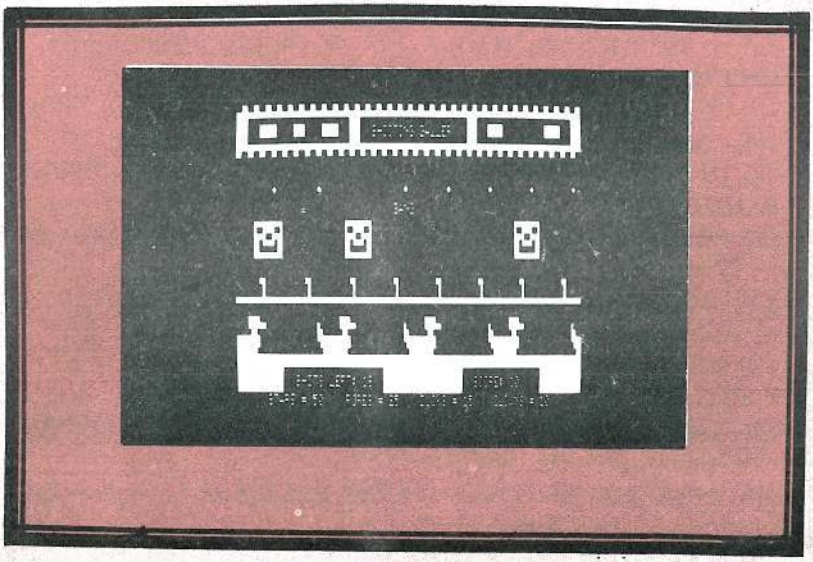
SHOOTING GALLERY

A flying arrow? That's right. With SHOOTING GALLERY you can prove, once and for all, who is the fastest gunslinger in town!

by Frank B. Rowlett

So, you're a crack shot who draws a bead with deadly accuracy? Well, you might not get your name on a poster, but you will be able to prove who's got the coolest, steadiest hand in town (and rid yourself of repressed hostilities at the same time).

Shooting gallery is modeled after the carnival and arcade games where a nickel once bought you ten shots at an assortment of animated targets. These days, the carnivals seem to charge half a dollar, which means that the savings from a few games played on your TRS-80 should go a long way toward paying for that new disk drive!!



```
10
          'SHOOTING GALLERY'
COPYRIGHT 1979 BY FRANK B. ROMLETT, JR.
20 CLEAR2000:DEFSTRD:DEFINTX-Z:RANDOM
30 GOSUB500
40 DC(0)="      "+CHR$(183)+CHR$(187)+CHR$(143)+CHR$(183)+CHR$(18
7)+"       ":DC(1)="      "+CHR$(191)+CHR$(178)+CHR$(179)+CHR$(177
)+CHR$(191)+"       ":DC(2)=DC(0)+DC(0)+DC(0)+DC(0)+DC(0):DC(3)=D
C(1)+DC(1)+DC(1)+DC(1)+DC(1)
50 DD(0)="     "+CHR$(180)+"    "+CHR$(175)+CHR$(159)+CHR$(140)+"
    ":DD(1)="     "+CHR$(139)+STRING$(4,CHR$(191))+CHR$(159)+"
   ":DD(2)=DD(0)+DD(0)+DD(0)+DD(0)+DD(0):DD(3)=DD(1)+DD(1)+DD(1)
+DD(1)+DD(1):DT="--100-->"
60 DP(0)=CHR$(171)+"        ":DP(1)=DP(0)+DP(0)+DP(0)+DP(0)+DP(0)
+DP(0)+DP(0)+DP(0):DS(0)="*        ":DS(1)=DS(0)+DS(0)+DS(0)+DS(0
)+DS(0)+DS(0)+DS(0)+DS(0)+DS(0)
70 REM
* INITIALIZE PROGRAM *
80 CLS:D0=CHR$(188)+CHR$(191):D1=CHR$(140)+CHR$(143):D2=D1+D1+D1
+D1+D1+D1+D1+D1+D1:D3=CHR$(143)+CHR$(131):D4=STRING$(2,CHR$(191)
)
90 PRINT@0,D0;D2;D0;D1;D2;D0;D2;D0;D4;"  ";STRING$(3,CHR$(143));
"        ";STRING$(3,CHR$(143));"  ";D4;"  SHOOTING GALLERY  ";D
4;"  ";STRING$(3,CHR$(143));"        ";STRING$(3,CHR$(143));"  "
;D4:FORX=128TO190STEP2:PRINT@X,D3;:NEXTX
100 PRINT@832,STRING$(8,CHR$(191));STRING$(18,CHR$(143));STRING$
(15,CHR$(191));STRING$(15,CHR$(143));STRING$(16,CHR$(191));"  SH
OTS LEFT: 20  ";STRING$(15,CHR$(191));"  SCORE: 0     ";STRING$(
8,CHR$(191));
110 PRINT@640,STRING$(64,CHR$(131));:PRINT@960,"<><> STARS = 50
   PIPES = 25    DOCKS = 15    CLOWNS = 10 <><>";
120 YB=20:YS=0:XC=16:XD=16:XS=1:XP=1:D4=STRING$(2,CHR$(143)):Z=3
51:YA=0
130 REM
* START GAME *
140 GOSUB260:FORX=0TO3:IFPOINT(20,3)THENPRINT@74,"<>";:PRINT@116
,D4;ELSEPRINT@74,D4;:PRINT@116,"<>";
150 IFYB=0THENIFPEEK(14656)=1THEN30ELSEPRINT@348,"     ";:FORYS=
0TO20:NEXTYS:PRINT@348,"ENTER";
160 GOSUB290:IFX=0ORX=2THENDC(2)=MID$(DC(0),XC,1)+LEFT$(DC(2),79
```

```
):DC(3)=MID$(DC(1),XC,1)+LEFT$(DC(3),79):XC=XC-1:IFXC=0THENXC=16
170 PRINT@384,RIGHT$(DC(2),64);RIGHT$(DC(3),64);:GOSUB260
180 GOSUB290:DD(2)=MID$(DD(0),XD,1)+LEFT$(DD(2),79):DD(3)=MID$(D
D(1),XD,1)+LEFT$(DD(3),79):XD=XD-1:IFXD=0THENXD=16
190 PRINT@704,RIGHT$(DD(2),64);RIGHT$(DD(3),64);:GOSUB260
200 GOSUB290:IFX<>3THENDP(1)=RIGHT$(DP(1),63)+MID$(DP(0),XP,1):X
P=XP+1:IFXP=9THENXP=1
210 PRINT@576,DP(1);:GOSUB260
220 GOSUB290:DS(1)=RIGHT$(DS(1),63)+MID$(DS(0),XS,1):XS=XS+1:PRI
NT@256,DS(1);:IFXS=9THENXS=1
230 GOSUB260
240 NEXTX:GOTO140
250 REM
* PRINT SIGHT AND BACKGROUND *
260 GOSUB570:IFPEEK(15360+Z)<>43THENYL=PEEK(15360+Z):PRINT@Z,"+"
;:RETURN
270 PRINT@Z,CHR$(YL);:RETURN
280 REM
* MOVE SIGHT AND SEE IF GUN FIRED *
290 GOSUB260:IFPEEK(15360+Z)=43THENPRINT@Z,CHR$(YL);
300 DB=INKEY$:IFDB=" "THEN370ELSEY=PEEK(14656):IFY>127THENY=Y-12
8
310 IFY>32THENY=Y-64:ZL=ABS(Z/64):IFZ-ZL*64<63THENZ=Z+1
320 IFY>16THENY=Y-32:ZL=ABS(Z/64):IFZ-ZL*64>0THENZ=Z-1
330 IFY>8THENY=Y-16:IFZ<768THENZ=Z+64
340 IFY>4THENIFZ>255THENZ=Z-64
350 RETURN
360 REM
* SHOOT THE GUN *
370 IFYB=0THENRETURNELSEPRINT@348,"BANG!!!";:ZL=ABS((Z-192)/64):
ZS=Z-(ZL*64)-191:ONZLGOTO400,380,410,410,380,420,390,430,440
380 IFYL<>32THENYS=YS+100:PRINT@192+ZL*64,CHR$(30);:YA=0
390 YB=YB-1:PRINT@917,YB;:PRINT@945,YS;:PRINT@348,CHR$(30);:IFYB
=0THENPRINT@331,"GAME OVER, HOLD ";CHR$(34);"ENTER";CHR$(34);" D
OWN TO PLAY AGAIN";:RETURNELSERETURN
400 IFMID$(DS(1),ZS,1)="*"THENDS(1)=LEFT$(DS(1),ZS-1)+" "+RIGHT$
(DS(1),64-ZS):PRINT@256,DS(1);:YS=YS+50:GOTO390ELSE390
410 IFMID$(DC(2),ZS+16,1)=" "THEN390ELSEYS=YS+10:DT(0)=DC(2):DT(
1)=DC(3):GOSUB470:DC(2)=DT(0):DC(3)=DT(1):PRINT@384,RIGHT$(DC(2)
```

```
,64);RIGHT$(DC(3),64);:GOTO390
420 IFMID$(DP(1),ZS,1)=" "THEN390ELSEDP(1)=LEFT$(DP(1),ZS-1)+" "
+RIGHT$(DP(1),64-ZS):PRINT@576,DP(1);:YS=YS+25:GOTO390
430 IFMID$(DD(2),ZS+16,1)=" "THEN390ELSE450
440 IFMID$(DD(3),ZS+16,1)=" "THEN390
450 YS=YS+15:DT(0)=DD(2):DT(1)=DD(3):GOSUB470:DD(2)=DT(0):DD(3)=
DT(1):PRINT@704,RIGHT$(DD(2),64);RIGHT$(DD(3),64);:GOTO390
460 REM
* BLANK OUT OBJECT IN STRING *
470 IFZS>55THEN480ELSEFORXX=0TO1:DT(XX)=LEFT$(DT(XX),ZS+9)+STRIN
G$(13," ")+RIGHT$(DT(XX),58-ZS):NEXTXX:RETURN
480 FORXX=0TO1:DT(XX)=LEFT$(DT(XX),70)+STRING$(10," "):NEXTXX:RE
TURN
490 REM
* SEE IF THEY WANT INSTRUCTIONS *
500 CLS:DB="N":PRINT@24,"SHOOTING GALLERY":PRINT@147,"DO YOU WAN
T INSTRUCTIONS";:INPUTDB:IFASC(DB)<>89THENRETURNELSEPRINT@64,CHR
$(31);
510 REM
* PRINT OUT INSTRUCTIONS *
520 PRINT@128,"YOU AIM AND SHOOT AT THE MOVING TARGETS ON THE SC
REEN.  THE GUN SIGHT IS THE BLINKING +.  YOU CAN MOVE IT RIGHT W
ITH THE ";CHR$(94);" KEY, LEFT WITH THE ";CHR$(93);" KEY, UP WIT
H THE [ KEY AND DOWN WITH THE ";CHR$(92);" KEY."
530 PRINT"HOLDING THESE KEYS DOWN CONTINUES MOVING THE SIGHT, AN
D ANY":PRINT"COMBINATION OF THESE KEYS CAN BE PRESSED AT ONE TIM
E.":PRINT@512,"YOU CAN SHOOT THE GUN BY PRESSING THE SPACE BAR--
ONE SHOT FOR":
540 PRINT"EACH TIME YOU PRESS IT.  IF THE SIGHT IS ON A TARGET W
HEN YOU":PRINT"SHOOT, THE TARGET DISAPPEARS AND YOU GET THE SCOR
E VALUE OF":PRINT"THAT TARGET ADDED TO YOUR SCORE.  YOU HAVE 20
SHOTS.":PRINT@832,"--GOOD SHOOTING!"
550 PRINT@977,"(PRESS ";CHR$(34);"ENTER";CHR$(34);" TO BEGIN GAM
E)";:INPUTDB:RETURN
560 REM
* HANDLE 100 POINT ARROW *
570 IFYA=1THEN590ELSEIFRND(99)<>50THENRETURN
580 YA=1:YO=RND(3):YG=-2
590 YG=YG+2:ONYOGOTO610,620
```

```
600 YT=512:GOTO630
610 YT=192:GOTO630
620 YT=320
630 PRINT@YT,CHR$(30);:IFYG=58THENYA=0:RETURN:ELSEPRINT@YT+YG,DT
;:RETURN
```


PERCOM

DISK DRIVES
Now in Stock

The TRS-80 Software Exchange is pleased to offer single and dual Percom Disk Drives for your TRS-80. These are reliable, high quality drives, fully compatible with the TRS-80 and Radio Shack's drives.

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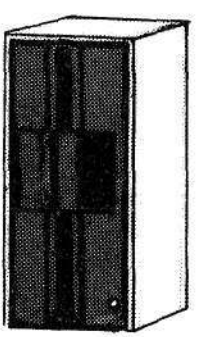

NOTE: All disks require TRSDOS software, available only from Radio Shack.

TSE TRS-80 Software Exchange
17 BRIAR CLIFF DRIVE
MILFORD, NEW HAMPSHIRE 03055

It's Back to School Time!

If you're heading back to school, or work, this fall, you probably have often thought that it would be a lot easier if you didn't have to "hunt and peck" at the typewriter or computer keyboard. If you could only double your typing speed, the job would be done in half the time! And, with increased speed and confidence comes increased accuracy.

TYPING TUTOR

by 80 US

Typing Tutor is a set of programs designed to teach you touch typing — from the basics of learning where the keys are, to practice drills at speeds that would make a Selectric shudder! Each lesson is displayed on the screen, including, at the early stages, a keyboard diagram. You are quizzed and graded, and you progress at your own pace. When you have mastered a lesson, the computer advances to the next, using CAI (computer aided instruction). Progress is fast, painless, and even fun as you keep pushing to break your own record.

So, whether you're going back to school or just want to enter programs from **SoftSide** that much faster, **Typing Tutor** can help.

Order a copy today and be a better typist by next week.

Level II, 16K — $19.95

TSE TRS-80 Software Exchange

17 Briar Cliff Drive Milford, New Hampshire 03055

The VAL function is used to convert numbers which are written as strings, back into numeric notation. VAL has the effect of stripping off the strings or dollar sign.

Function

For example:

```
10 A$="35"
20 PRINT VAL(A$)
```

prints the number 35 as a numeric value.

TEST PROGRAM

```
10 REM "VAL" TEST PROGRAM
20 A$="45.12"
30 A=VAL(A$)
40 PRINT "IF THE STRING ";A$;" IS CONVERTED TO THE NUMBER";A
50 PRINT "THEN THE VAL FUNCTION PASSED THE TEST."
99 END
```

SAMPLE RUN

```
IF THE STRING 45.12 IS CONVERTED TO THE NUMBER 45.12
THEN THE VAL FUNCTION PASSED THE TEST.
```

VARIATIONS IN USAGE

Some computers (e.g. the TRS-80 Level II and other Microsoft variations) allow the use of combinations of numbers and letters with the VAL function, but the numbers must precede the letters. If they don't, the VAL function produces a 0 indicating it did not find a number as the first character.

For example, `PRINT VAL("123ABC")` prints the number 123.

TEST PROGRAM

```
10 REM "VAL WITH MIXED STRING" TEST PROGRAM
20 A$="12 O'CLOCK"
30 A=VAL(A$)
40 PRINT "IF THE STRING ";A$;" IS CONVERTED TO THE NUMBER";A
50 PRINT "THE VAL FUNCTION ACCEPTED NUMBERS MIXED WITH LETTERS."
99 END
```

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ST80D

Lance Micklus' ST80-the Smart Terminal Program- just got SMARTER!!

ST80D contains extensions for disk drive systems to exchange files with a timesharing computer or another TRS-80.

USING ST80D, your TRS-80 can do all this and more:

- Gather and pre-format data, store it on disk, then transmit it to a timesharing computer for processing.
- Processed data from the timesharing computer can then be sent back to the TRS-80.
- One TRS-80 can generate a data base and share it with another TRS-80 thousands of miles away by telephone.
- Users may customize their terminal program by redefining the translation tables. Conversion from one set of tables to another takes only seconds.
- Auto logon feature sends your account name, number and password upon request.
- ST80D can transmit any type of TRS-80 ASCII file, including BASIC programs stored in ASCII format, and most BASIC data files. Binary files can also be transmitted from one TRS-80 to another, allowing even machine language programs to be sent over the phone.

ST80D is a practical, full-feature terminal program that has been used on a variety of timesharing systems. These include IBM 370, Honeywell Sigma/6, Harris/7, DECSYSTEM 20, Dartmouth Timesharing, CDC Cyber and HP 2000.

If you're looking for a professional quality product, **not an amateur program**, then order ST80D today!

For 32K disk systems - **$79.95**

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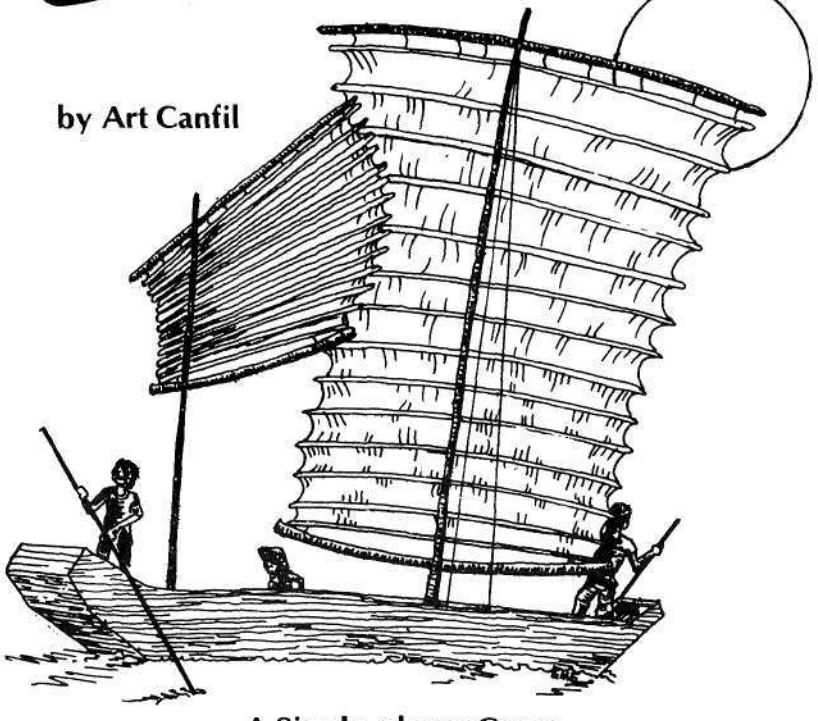
CAI PAN

by Art Canfil



A Single-player Game
Based on the China Trade of the 1800's

Ply arms and opium in exotic oriental ports, dodging pirates, cutthroats, usurious moneylenders and tropical storms. Should you arm your ship to stand and fight, or keep it light to run swiftly? Will the price of opium still be high in Hong Kong when you return laden with the stuff from Batavia? **Warning:** If you get a polite message from Brother Wu, the moneylender or Li Yuen, the pirate, you'd better pay attention! If you outwit your enemies, you win by piling up a million dollars in profits.

Level II, 16K — $9.95

TSE TRS-80 Software Exchange

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StoryBook

by Otto Hansen

Here is an ideal introduction to the computer for young children of pre-school age through about second grade. This imaginative program allows the kids to enter the story and become part of an exciting adventure.

For very young children, best results are obtained when parents read with them, inviting their comments and participation by, for instance, supplying sound effects. Older children can enhance their reading ability with the practice afforded by the ever-changing nature of the stories (which make "rote" reading impossible).

The program asks the child's name and age, the names of his/her best friends, the best-loved pet, the least-liked wild animal, the favorite color and number, etc.; and weaves all of this information into an individualized story which may feature rambling roadways or winding trails, rolling plains, caves or a desert full of cactuses, pearly shells or golden bricks — as the "storyteller" chooses.

Just as with all good children's stories, dangers are survived, obstacles overcome, and the friends always arrive back home unharmed, laden with riches such as lollipops and gumdrops. The ending is happy, and the inexhaustible storyteller will go right on to a new adventure, never short of patience, time or inventiveness, if the child asks.

The speed of presentation is controllable for various levels of reading comprehension. Graphics are used for illustration and animation. And, best of all, your child can spend some time away from the television learning to read and becoming comfortable with the computer at the same time!

```
10 CLS:PRINTCHR$(23):PRINT@460,"S T O R Y -- B O O K":V1=2000:GO
SUB2750
20 V1=250
30 DEFSTR A-J
40 CLEAR1000
50 CLS
60 INPUT"WHAT IS YOUR FIRST NAME";A$
70 INPUT"WHAT IS THE NAME OF YOUR BEST FRIEND";A1$
80 INPUT"NAME SOMEBODY ELSE THAT YOU LIKE";A2$
90 INPUT"NAME ONE MORE FRIEND ";AX$
100 INPUT"YOUR FAVORITE COLOR";A3$
110 INPUT"AND WHAT IS YOUR LUCKY NUMBER (LESS THAN 50)";A4$
120 INPUT"WHAT IS YOUR FAVORITE PET";A5$
130 INPUT"WHAT IS YOUR FAVORITE WILD ANIMAL";A6$
140 INPUT"NAME ONE YOU DON'T LIKE";A8$
150 INPUT"TYPE A '1' IF YOU ARE A GIRL, A '2' IF A BOY";M
160 INPUT"HOW OLD ARE YOU";M4
170 M2=6
180 CLS
190 PRINT"ARE YOU A FAST READER (TYPE '1')"
200 PRINT"AN AVERAGE READER (TYPE '2')"
210 PRINT"A SLOW READER (TYPE '3')"
220 PRINT"A VERY SLOW READER (TYPE '4')"
230 INPUTY1
240 ONV1GOSUB250,260,270,280:GOTO290
250 V1=1000:RETURN
260 V1=2000:RETURN
270 V1=4000:RETURN
280 V1=8000:RETURN
290 M1=RND(M2)
300 ONM1GOSUB310,320,330,340,350,360:GOTO370
310 AA$="ONCE UPON A TIME ":RETURN
320 AA$="IT IS TOLD IN SECRET WHISPERS ":RETURN
330 AA$="IN TIMES OF LONG AGO ":RETURN
340 AA$="NOT TO DISTANT IN THE PAST ":RETURN
350 AA$="IN ANCIENT TIMES OF OLD ":RETURN
360 AA$="WAY BACK IN HISTORICAL WRITINGS ":RETURN
370 M1=RND(M2)
380 ONM1GOSUB390,400,410,420,430,440:GOTO450
390 AB$="RAN AWAY FORM HOME ON ":RETURN
```

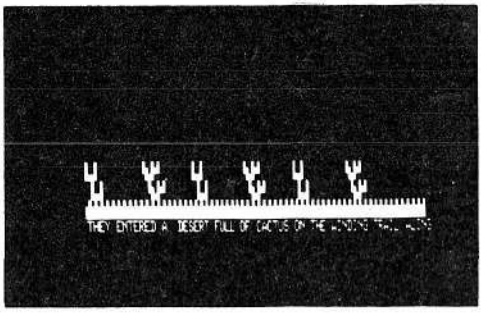
```
400 AB$="WAS WHISKED AWAY FROM HIS HOUSE ON ":RETURN
410 AB$="DECIDED TO LEAVE HOME FOR AN ADVENTURE ON ":RETURN
420 AB$="LEFT HOME AFTER SUPPER ON ":RETURN
430 AB$="LEFT HOME IN THE DEEP OF NIGHT ON ":RETURN
440 AB$="SLIPPED AWAY INTO THE DARK ON ":RETURN
450 M1=RND(M2)
460 ONM1GOSUB470,480,490,500,510,520:GOTO530
470 B$="BEAUTIFUL ":RETURN
480 B$="PRETTY ":RETURN
490 B$="DELICATE ":RETURN
500 B$="SENSITVE ":RETURN
510 B$="LOVELY ":RETURN
520 B$="FANTASTIC ":RETURN
530 M1=RND(M2)
540 IFM=1GOTO620
550 ONM1GOSUB560,570,580,590,600,610:GOTO620
560 B$="MATURE ":RETURN
570 B$="HANDSOME ":RETURN
580 B$="NICE LOOKING ":RETURN
590 B$="SMART ":RETURN
600 B$="FANTASTIC ":RETURN
610 B$="PRACTICAL ":RETURN
620 M1=RND(M2)
630 ONM1GOSUB640,650,660,670,680,690:GOTO700
640 C$="YOUNG ":RETURN
650 C$="YOUTHFUL ":RETURN
660 C$="LITTLE ":RETURN
670 C$="WHIPPERSNAPPER OF A ":RETURN
680 C$="PUNKY ":RETURN
690 C$="FUN-LOVING ":RETURN
700 M1=RND(M2)
710 ONM1GOSUB720,730,740,750,760,770:GOTO1870
720 D$="A MAGIC CARPET ":F1$=CHR$(128)+CHR$(183)+CHR$(179)+CHR$(
179)+CHR$(187):RETURN
730 D$="THE BACK OF A WINGED WHITE HORSE ":F1$=CHR$(128)+CHR$(13
1)+CHR$(151)+CHR$(171)+CHR$(139):RETURN
740 D$="A GOLDEN CHARIOT ":F1$=CHR$(128)+CHR$(136)+CHR$(175)+CHR
$(133):RETURN
750 D$="A FLUFFY DREAM-LIKE CLOUD ":F1$=CHR$(128)+CHR$(191)+CHR$
(191):RETURN
```

```
760 D$="MAGIC ROLLER-SKATES ":F1$=CHR$(128)+CHR$(172)+CHR$(140)+
CHR$(140)+CHR$(156):RETURN
770 D$="A FLEETING BREEZE ":F1$=CHR$(128)+CHR$(140)+CHR$(162)+CH
R$(179)+CHR$(166)+CHR$(166)+CHR$(187):RETURN
780 M1=RND(M2)
790 ONM1GOSUB800,810,820,830,840,850:GOTO860
800 AC$=" WHICH TRANSPORTED THEM TO A":RETURN
810 AC$="WHICH DELIVERED THEM POST HASTE TO A":RETURN
820 AC$=" WHICH WHIPPED THEM OFF TO A":RETURN
830 AC$=" WHICH CARRIED THEM AWAY TO A":RETURN
840 AC$=" WHICH FLEETEDLY FLEW THEM TO A":RETURN
850 AC$=" WHICH DEPOSTED THEM QUICKLY TO A":RETURN
860 M1=RND(M2)
870 ONM1GOSUB880,890,900,910,920,930:GOTO940
880 AD$=" CAVE":F2$=STRING$(63,CHR$(191)):F3$=STRING$(30,CHR$(19
1))+STRING$(4,CHR$(128))+STRING$(29,CHR$(191)):F4$=STRING$(28,CH
R$(191))+STRING$(8,CHR$(128))+STRING$(27,CHR$(191)):RETURN
890 AD$=" MOUNTRAIN SIDE":F2$=STRING$(30,CHR$(128))+STRING$(4,CHR
$(191))+STRING$(29,CHR$(128)):F3$=STRING$(26,CHR$(128))+STRING$(
12,CHR$(191))+STRING$(23,CHR$(128)):F4$=STRING$(15,CHR$(128))+ST
RING$(38,CHR$(191)):RETURN
900 AD$=" DEEP FOREST":F4$=CHR$(128)+STRING$(8,CHR$(191))+CHR$(1
28):F2$=F4$+F4$+F4$+F4$+F4$+F4$+F4$:F3$=F2$:F5$=STRING$(4,CHR$(128))
+CHR$(170)+STRING$(5,CHR$(128)):F4$=F5$+F5$+F5$+F5$+F5$+F5$+F5$:RETU
RN
910 AD$=" VAST FIELD OF PERFUMED FLOWERS":F3$=CHR$(128)+CHR$(153
)+CHR$(145)+CHR$(128)+CHR$(128)+CHR$(128):F3$=F3$+F3$+F3$+F3$+F3
$+F3$+F3$+F3$+F3$+F3$+F3$:F2$=CHR$(128)+F3$:RETURN
920 AD$=" DESERT FULL OF CACTUS":F2$=CHR$(181)+CHR$(186)+STRING$
(8,CHR$(128))+CHR$(173)+CHR$(186)+CHR$(142)+STRING$(6,CHR$(128))
:F2$=F2$+F2$+F2$:F3$=CHR$(128)+F2$:F4$=STRING$(63,CHR$(190)):RET
URN
930 AD$=" SEA SIDE COVE":F2$=STRING$(5,CHR$(128))+STRING$(5,CHR$
(188))+CHR$(190):F3$=STRING$(3,CHR$(140))+STRING$(7,CHR$(143))+C
HR$(175):F4$=CHR$(139)+STRING$(5,CHR$(191))+STRING$(12,CHR$(188)
)+CHR$(135)+CHR$(131):RETURN
940 M1=RND(M2)
950 ONM1GOSUB960,970,980,990,1000,1010:GOTO1020
960 AE$=" ILLUMINATED THE SURROUNDINGS.":RETURN
970 AE$=" BATHED THE LANDSCAPE ALL ABOUT.":RETURN
```

```
980 AE$=" SWATHED THE AREA WITH COLOR.":RETURN
990 AE$=" COVERED ALL WITH A GENTLE HUE.":RETURN
1000 AE$=" SPECKLED THE AREA WITH FLICKERY SPOTS.":RETURN
1010 AE$=" FLASHED BRILLIANT RAYS ALL AROUND.":RETURN
1020 M1=RND(M2)
1030 ONM1GOSUB1040,1050,1060,1070,1080,1090:GOTO1100
1040 AF$=" STANDING":RETURN
1050 AF$=" SITTING":RETURN
1060 AF$=" LAYING":RETURN
1070 AF$=" STANDING ON THEIR HEADS":RETURN
1080 AF$=" SKIPPING":RETURN
1090 AF$=" DANCING":RETURN
1100 M1=RND(M2)
1110 ONM1GOSUB1120,1130,1140,1150,1160,1170:GOTO1180
1120 AG$=" CROOKED PATH":RETURN
1130 AG$=" RAMBLING ROADWAY":RETURN
1140 AG$=" TWISTY AVENUE":RETURN
1150 AG$=" WINDING LANE":RETURN
1160 AG$=" TWISTING STREET":RETURN
1170 AG$=" WINDING TRAIL":RETURN
1180 M1=RND(M2)
1190 ONM1GOSUB1200,1210,1220,1230,1240,1250:GOTO1260
1200 AH$=" GOLDEN BRICKS":F5$=CHR$(128)+CHR$(183)+CHR$(179)+CHR$
(187)+CHR$(128):F6$=F5$:FORF0=1TOVAL(A4$)-1:F5$=F5$+F6$:NEXTF0:R
ETURN
1210 AH$=" SILVER BARS":F5$=CHR$(128)+CHR$(188)+CHR$(188)+CHR$(1
88):F6$=F5$:FORF0=1TOVAL(A4$)-1:F5$=F5$+F6$:NEXTF0:RETURN:RETURN
1220 AH$=" MARSHMELLOW PILLOWS":F5$=CHR$(128)+CHR$(166)+CHR$(179
)+CHR$(153):F6$=F5$:FORF0=1TOVAL(A4$)-1:F5$=F5$+F6$:NEXTF0:RETUR
N
1230 AH$=" $100 DOLLAR BILLS":F5$=CHR$(128)+"$100":F6$=F5$:FORF0
=1TOVAL(A4$)-1:F5$=F5$+F6$:NEXTF0:RETURN
1240 AH$=" TURTLE SHELLS":F5$=CHR$(128)+CHR$(174)+CHR$(174):F6$=
F5$:FORF0=1TOVAL(A4$)-1:F5$=F5$+F6$:NEXTF0:RETURN
1250 AH$=" HUGE PEARLY SHELLS":F5$=CHR$(128)+CHR$(170)+CHR$(153)
:F6$=F5$:FORF0=1TOVAL(A4$)-1:F5$=F5$+F6$:NEXTF0:RETURN
1260 M1=RND(M2)
1270 ONM1GOSUB1280,1290,1300,1310,1320,1330:GOTO1340
1280 AI$=" FLABBERGASTED,":RETURN
1290 AI$=" SHOCKED,":RETURN
```

```
1300 AI$=" ASTOUNDED,":RETURN
1310 AI$=" FRIZZLE-FRAZZLED,":RETURN
1320 AI$=" BUG-EYED,":RETURN
1330 AI$=" AGOG AND AGAST,":RETURN
1340 M1=RND(M2)
1350 ONM1GOSUB1360,1370,1380,1390,1400,1410:GOTO1420
1360 AJ$=" RAN ON SWIFTLY":RETURN
1370 AJ$=" SKIPPED THE WAY":RETURN
1380 AJ$=" CAUTIOUSLY MOVED ON":RETURN
1390 AJ$=" JOGGED ON AHEAD":RETURN
1400 AJ$=" WALKED SLOWLY ON":RETURN
1410 AJ$=" CREPT QUIETLY ALONG":RETURN
1420 M1=RND(M2)
1430 ONM1GOSUB1440,1450,1460,1470,1480,1490:GOTO1500
1440 AK$=" FLOWING FIELDS FULL OF":RETURN
1450 AK$=" ROLLING PLAINS COVERED WITH":RETURN
1460 AK$=" PLOWED FIELDS PLANTED WITH":RETURN
1470 AK$=" ROLLING COUNTRY-SIDE COVERED WITH":RETURN
1480 AK$=" AMBLING HILLSIDES POPULATED WITH":RETURN
1490 AK$=" RAMBLI.'G FARMLAND COVERED WITH":RETURN
1500 M1=RND(M2)
1510 ONM1GOSUB1520,1530,1540,1550,1560,1570:GOTO1580
1520 AL$=" HUGE  COLORED BOULDERS":F6$=CHR$(128)+CHR$(143):RETUR
N
1530 AL$=" LARGE  PAINTED ROCKS".F6$=CHR$(128)+CHR$(130):RETURN
1540 AL$=" TALL  HUED FLOWERS":F6$=CHR$(128)+CHR$(136)+CHR$(157)
:RETURN
1550 AL$=" MONSTROUS  PUMPKINS:F6$=CHR$(128)+CHR$(174)+CHR$(191
)+CHR$(157):RETURN
1560 AL$=" BIG  WATERMELLONS":F6$=CHR$(128)+CHR$(183)+CHR$(187):
RETURN
1570 AL$=" FANCY PINKERDOTTED ROSES":F6$=CHR$(128)+CHR$(162)+CHR
$(166):RETURN
1580 M1=RND(M2)
1590 ONM1GOSUB1600,1610,1620,1630,1640,1650:GOTO1660
1600 AM$=" TINY TREES":F7$=CHR$(175)+CHR$(133):RETURN
1610 AM$=" SWEET SCENTED BUSHES":F7$=CHR$(169)+CHR$(129):RETURN
1620 AM$=" GREAT SWAYING OAKS":F7$=CHR$(175)+CHR$(133):RETURN
1630 AM$=" CHRISTMAS TREES":F7$=CHR$(91)+CHR$(91):RETURN
1640 AM$=" TOWERING PINES":F7$=CHR$(142)+CHR$(157):RETURN
```

```
1650 AM$=" DROOPING WILLOWS":F7$=CHR$(135)+CHR$(171)+CHR$(151)+C
HR$(139):RETURN
1660 M1=RND(M2)
1670 ONM1GOSUB1680,1690,1700,1710,1720,1730:GOTO1900
1680 AN$=" MARS BARS AND TOY CARS":F8$=CHR$(133)+CHR$(128)+CHR$(
38)+CHR$(128)+CHR$(172)+CHR$(143)+CHR$(140)+CHR$(156):RETURN
1690 AN$=" LICORICE STICKS AND BUILDING BRICKS":F8$=CHR$(149)+CH
R$(38)+CHR$(128)+CHR$(188)+CHR$(188):RETURN
1700 AN$=" GUM DROPS AND LOLLIPOPS":F8$=CHR$(132)+CHR$(38)+CHR$(
128)+CHR$(140)+CHR$(140)+CHR$(191)+CHR$(191):RETURN
1710 AN$=" CHOCOLATE MOUSES AND PLAY HOUSES":F8$=CHR$(172)+CHR$(
172)+CHR$(129)+CHR$(38)+CHR$(128)+CHR$(151)+CHR$(171)+STRING$(5,
CHR$(187)):RETURN
1720 AN$=" TASTY CAKE AND THINGS TO MAKE":F8$=STRING$(3,CHR$(188
))+CHR$(38)+CHR$(128)+CHR$(152)+CHR$(128)+CHR$(149)+CHR$(128)+CH
R$(154)+CHR$(128)+CHR$(175)+CHR$(170):RETURN
1730 AN$=" FANCY PIE AND PLANES THAT FLY":F8$=STRING$(3,CHR$(176
))+CHR$(38)+CHR$(128)+CHR$(141)+CHR$(140)+CHR$(157):RETURN
1740 ONM1GOSUB1680,1690,1700,1710,1720,1730:GOTO1900
1750 N0=RND(26)+64
1760 N1=RND(26)+64
1770 N2=RND(26)+64
1780 N3=RND(26)+64
1790 N4=RND(26)+64
1800 N5=RND(26)+64
1810 N6=45
1820 N7=RND(26)+64
1830 N8=RND(26)+64
1840 N9=RND(26)+64
1850 RETURN
1860 M1=RND(M2):RETURN
1870 CLS:PRINT@448,:PRINTAA$:PRINT"A ";B$;C$;"PERSON";",";A$;" A
ND ";A1$;",A FRIEND":GOSUB2750
1880 PRINT" OF ";A$;"'S ";AB$:PRINTD$:GOSUB2760:GOSUB2750
1890 GOTO780
1900 PRINT@0,F2$:PRINTF3$:PRINTF4$:PRINT@448,AC$;AD$:GOSUB2750
1910 PRINT" WHERE ";A3$;" LIGHT";AE$:GOSUB2750
1920 PRINTA$;" AND ";A1$;" FOUND THEMSELVES":PRINTAF$;" ON A";AG
$
```



```
1930 Y=10:N=RND(3):N=N+2:FORX=1TO125:SET(X,Y):SET(X,Y+1):SET(X,Y
+2):N=RND(2):IFN=1THENNEXTXELSEN=RND(3):N=N-2:Y=Y+N:IF(Y<1)OR(Y>
46)THENY=1ELSENEXTX
1940 GOSUB2750
1950 PRINT"WHICH WAS PAVED WITH";AH$;" ";A4$;" FEET WIDE":PRINT@
0,F5$:GOSUB2750
1960 PRINTA$;" AND ";A1$;" STARTED DOWN THE"AG$:GOSUB2750
1970 M1=RND(M2):ONM1GOSUB640,650,660,670,680,690
1980 PRINT"AND IN A WHILE MET  A ";C$;"";" ";A6$;" WHO SAID":GOS
UB2750
1990 PRINT"'MY NAME IS ";A2$;"'":GOSUB2750
2000 PRINTA$;" WAS SIMPLY";AI$;" THAT ANIMALS COULD TALK.":GOSUB
2750
2010 PRINTA6$;"-";A2$;" ADVISED THEM TO TAKE CARE FOR DANGER LAY
 AHEAD.":GOSUB2750
2020 FORF0=1TO10:N=RND(1000):PRINT@N,"DANGER ! !":NEXTF0
2030 PRINT"THEY SAID GOODBYE AND THANKED ";A6$;"-";A2$:GOSUB2750
2040 PRINT"AND";AJ$;" DOWN THE";AG$;" UNTIL THEY CAME":GOSUB2750
2050 PRINT"OUT OF THE ";AD$;".":PRINTF2$:PRINTF3$:PRINTF4$:GOSUB
2750
2060 PRINTA1$;" AND ";A$;" NOW FOUND THE ";AG$;" LEADING OFF INT
O ":GOSUB2750
2070 PRINTAK$:GOSUB2750
2080 M1=RND(M2):ONM1GOSUB470,480,490,500,510,520
2090 PRINTAL$;" WHICH WAS SIMPLY ";B$;".":GOSUB2750:FORF0=1TO30:
N=RND(960):PRINT@N,F6$:NEXTF0:GOSUB2750
2100 PRINT"BOTH SIDES OF THE";AG$;" WERE LINED WITH"AM$;".":PRIN
TF7$;:PRINT"       ";:PRINTF7$:PRINT"  ";:PRINTF7$;:PRINT"      "
;:PRINTF7$:PRINT"     ";:PRINTF7$;:PRINT"      ";:PRINTF7$:PRINT"
      ";:PRINTF7$;:PRINT"      ";:PRINTF7$;:PRINT@0,"";:GOSUB275
0
2110 PRINT@320,F8$
2120 PRINT"FROM WHICH HUNG";AN$:GOSUB2750
2130 PRINTA$;" AND ";A1$;" STARTED PICKING ALL THEY COULD CARRY"
:GOSUB2750
2140 FORF0=1TOM4:PRINTF8$;:PRINT"     ";:NEXTF0:PRINT""
2150 PRINT"AND SOON GOT SEPARATED":GOSUB2750
2160 PRINT"JUST THEN A PACK OF ";M4;" ";A8$;"S SWOOPED ":GOSUB27
50
```

```
2170 PRINT"DOWN AND CARRIED ";A1$;" OFF TO THE";AL$;". ":GOSUB275
0
2180 FORF0=1TO15:N=RND(899):PRINT@N,F6$:NEXTF0
2190 PRINT"SHOUTING 'AWAY ALL YOU ";A8$;"'S, WE EAT TONIGHT.'":G
OSUB2750
2200 PRINT"ALL OF A SUDDEN, ";A$;"'S ";A5$;" POPPED OUT FROM BEH
IND":GOSUB2750
2210 PRINTF7$;:PRINTF7$;:PRINTF7$;:PRINT"      ";CHR$(153)+CHR$(1
40)+CHR$(156)+CHR$(131)
2220 PRINT"A GROUP OF ";AM$;" AND GAVE CHASE NOISILY.":GOSUB2750
2230 PRINT"THEN THUNDERING DOWN THE ";AG$;" CAME ";A6$;:PRINT"-"
;A2$;".":GOSUB2750
2240 PRINT"WHO SAID 'QUICKLY ";A$;" GET ON MY BACK.'":GOSUB2750
2250 PRINT"AND OFF THEY WENT IN PURSUIT OF THE PACK OF ";A8$;"'S
.":GOSUB2750
2260 PRINT"WITH ";A$;"'S ";A5$;" LEADING THE WAY, THEY FINALLY C
AUGHT":GOSUB2750
2270 PRINT"UP WITH THE ";A8$;"S IN ";A4$;" MINUTES.":GOSUB2750
2280 GOSUB1750
2290 PRINTA6$;:PRINT"-";A2$;" YELLED 'LISTEN LEADER ";A8$;",TO M
Y MAGIC WORDS.'":GOSUB2750
2300 PRINTCHR$(23)
2310 PRINTCHR$(N0);CHR$(N1);CHR$(N2);CHR$(N3);CHR$(N4);
2320 PRINTCHR$(N5);CHR$(N6);CHR$(N7);CHR$(N8);CHR$(N9)
2330 GOSUB2750
2340 PRINT"AND THE ";A8$;" CHIEF TURNED INTO ";A$;"'S FRIEND ";A
X$:GOSUB2750
2350 FORF0=2TOM4:FA=RND(996):PRINT@FA,F6$;:NEXTF0:PRINT@448,"";
2360 PRINT"ALL THE OTHER ";A8$;"S TURNED INTO";AL$:GOSUB2750
2370 PRINTA6$;"-";A2$;" THEN LED THEM TO THE END OF THE";AG$:GOS
UB2750
2380 PRINT@0,F7$,F7$:PRINTF7$,F7$:PRINTF7$,F7$:PRINTF7$,F7$
2390 PRINT"BETWEEN THE";AM$;" AND SAID GOODBYE.":GOSUB2750
2400 M1=RND(M2)
2410 ONM1GOSUB880,890,900,910,920,930
2420 M1=RND(M2):ONM1GOSUB800,810,820,830,840,850
2430 M1=RND(M2):ONM1GOSUB1120,1130,1140,1150,1160,1170
2440 PRINTA$;" SAID DON'T GO YET, LISTEN TO MY MAGIC WORD AND SA
ID:":GOSUB2750
```

OK
OK
OK

MMSFORTH

INTRODUCTORY OFFER

The **MMSFORTH** system diskette or cassette tape provides for the expansion of **FORTH** commands by the user. There are many programs and routines provided as examples of **FORTH** programming, such as:

Routines For:
- String Handling
- Graphics
- File Sorting
- Screen Printing

Programs For:
- Game of Life
- Checkbook Balancing
- String Sort
- Number Guessing Game

The **TRS-80 Software Exchange** intends to fully support the introduction of **MMSFORTH** with the development of supporting application modules. Early **MMSFORTH** projects are:

- floating-point package
- assembler/cross compiler to provide standard TRS-80 load modules
- large flexible mailing list system
- generalized data base management system
- word-processing package (**FORTHWRITE**)

MMSFORTH, by **Miller Microcomputer Services**, includes introductory documentation with further references to the **MicroFORTH** primer of **FORTH, Inc.** This manual is an invaluable reference for the **FORTH** programmer, and can be purchased separately by anyone desiring more information on the **FORTH** language structure.

30-DAY INTRODUCTORY PRICE

MMSFORTH cassette version, Level II, 16K	$34.95
MMSFORTH disk version, Level II, 16K	44.95
MicroFORTH primer	15.00

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```
2450 GOSUB1750
2460 PRINTCHR$(23)
2470 PRINTCHR$(N0);CHR$(N1);CHR$(N2);CHR$(N3);CHR$(N4);CHR$(N5);
2480 PRINTCHR$(N6);CHR$(N7);CHR$(N8);CHR$(N9)
2490 GOSUB2750
2500 PRINT"AND THERE STOOD THE OTHER FRIEND ";A2$:GOSUB2750
2510 PRINT"ALL THE FRIENDS WERE SO HAPPY.":GOSUB2750
2520 PRINTF2$:PRINTF3$:PRINTF4$
2530 PRINT"THEY ENTERED A ";AD$;" ON THE"AG$;" ALONG":GOSUB2750
2540 PRINT"WHICH THEY FOUND ";D$;"WHICH THEY HOPPED ON.":GOSUB27
50
2550 GOSUB2760
2560 PRINTAC$;" PLACE THEY KNEW VERY WELL":GOSUB2750
2570 PRINTCHR$(23):PRINT" H O M E  ! ! .":GOSUB2750
2580 PRINT"THEIR FAMILY WAS SO HAPPY TO HAVE THEM BACK":GOSUB275
0
2590 PRINT"AND THEY WERE ALL RICH, FOR THEY HAD BOUGHT HOME":GOS
UB2750
2600 PRINT"WITH THEM :"
2610 PRINT"A STUFFED ";A6$
2620 PRINT"AND A SCULPTURED ";A8$
2630 PRINT"A WHOLE LOT OF";AN$
2640 PRINT"SOME ";B$;"";AL$
2650 PRINT"A WHOLE BUNCH OF";AH$:FORF0=1TO2000:NEXTF0:GOSUB2750
2660 PRINTF5$:FORF0=1TO VAL(A4$):PRINTF6$;"    ";:NEXTF0:FORF0=1
TOVAL(A4$):PRINTF8$;"    ";:NEXTF0:GOSUB2750
2670 GOSUB2760
2680 PRINT"AND OF COURSE ";D$;"WHICH THEY COULD USE ":GOSUB2750
2690 PRINT"WHENEVER THEY WANTED TO GO ON ANOTHER ADVENTURE.":GOS
UB2750
2700 PRINT
2710 PRINT"AND THEY ALL BECAME HAPPILY MARRIED AND LIVED A ":GOS
UB2750
2720 PRINT"LONG AND FRUITFUL LIFE.! ! ! ! ! ! "
2730 GOSUB2750:GOTO10
2740 END
2750 VV=V1:FORV=1TOVV:NEXTV:CLS:PRINT@448,:RETURN
2760 FORV=191TO248:PRINT@V,F1$;:FORV9=1TO10:NEXTV9:NEXTV:PRINT@2
48,"    ":RETURN
2770 CLS:GOSUB930:PRINT@0,F2$:PRINTF3$:PRINTF4$
```

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by John M. Nevison

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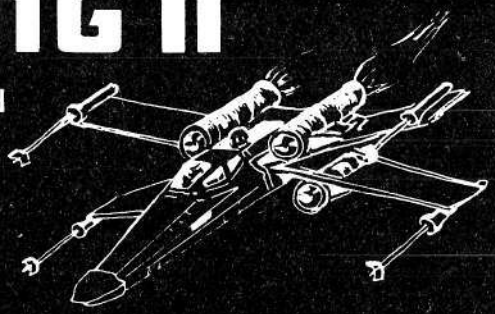
X-WING II

by Chris Freund



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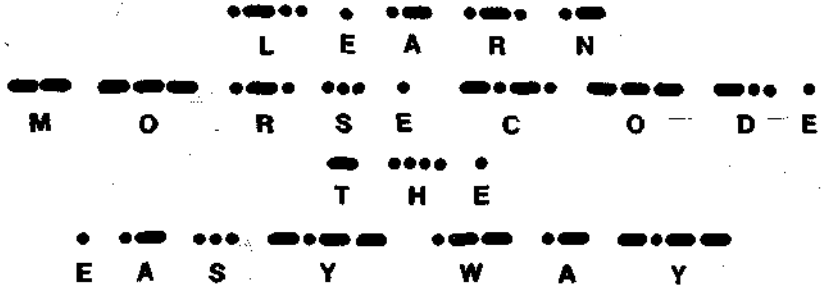
MORSE CODE TUTOR



by Donald E. Smith

Whoever said, "Practice makes perfect", must have been an instructor of Morse code. Most types of learning are best reinforced by drill, but rate learning, be it of a language or vocabulary, multiplication tables or musical scales, benefits most from proctice and repetition. To that last category we can also add Morse code, which is really nothing more than a new alphabet.

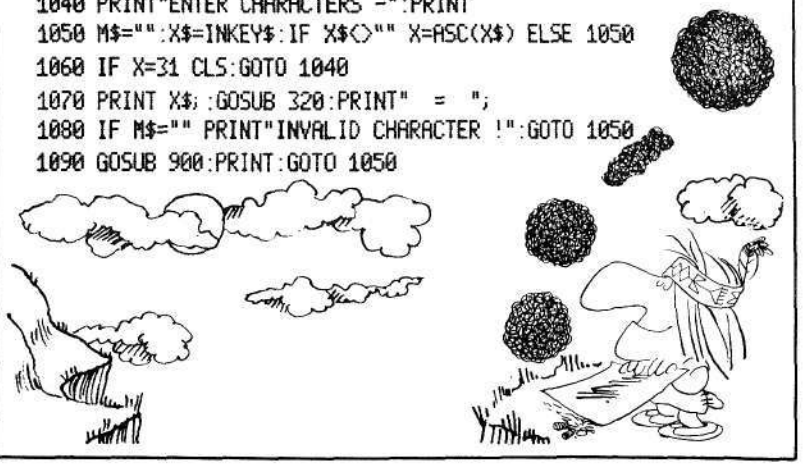
Three methods of learning Morse have emerged over the years. Each has its drawbacks. A friend could send practice messages; this requires a friend with time, patience, and a good knowledge of code. Records and tapes are available that promise "20 WPM in only 2 Weeks!"; these are like studying for an eye examination once you know what the letters are — the difficulty and the value are gone. The third alternative, and up to now the best, has been to tune in the American Radio Relay League's daily code practice sessions. These provide varying material and a natural sound, but require that you practice at the scheduled times, which may not be convenient.

Now there is a better way to study. Simply enter this program, place an AM radio (tuned near 540) at the right of your keyboard, and get set to learn the code in less time than you thought possible. When you've worked your way up to 20 WPM on familiar text, you'll be a certified "brass pounder"!

```
10 REM - MORSE CODE TUTOR - COPYRIGHT - DONALD E. SMITH - 1978
20 CLEAR 400:DEFINT A-C,K,L,X-Z:DIM A(64):CLS
30 PRINT"HI, I'M YOUR BASIC MORSE CODE TUTOR. I INSTRUCT"
40 PRINT"ON 3 ASCENDING LEVELS WITH USER DEFINED DIFFICULTY"
50 PRINT"1 = CHARACTER ENCODE - YOU ENTER CHARACTERS AND I'LL"
60 PRINT"    SEND AT THE RATE YOU CHOOSE, 5  WPM - NOVICE,"
70 PRINT"    13 WPM - GENERAL, 20 WPM - ADVANCED (HOT-DOGGER!)"
80 PRINT"2 = RANDOM CHARACTER PRACTICE - I SEND AND YOU COPY"
90 PRINT"    BY RESPONDING ON THE KEYBOARD. ";CHR$(91);
100 PRINT" = END OF WORK,"
110 PRINT"    > = END OF MESSAGE,  - = WAIT,  @ = ERROR"
120 PRINT"3 = TEXT - TO FURTHER IMPROVE YOUR COPY I'LL SEND"
130 PRINT"    A ONE LINE MESSAGE, BE FAIR THOUGH AND GET A"
140 PRINT"    BUDDY TO ENTER THE MESSAGE !"
150 INPUT"COMMAND ";K:CLS:IF K<1 OR K>3 THEN 50
160 INPUT"CHARACTER RATE(WPM) ";C
170 IF K=1 THEN 200 ELSE IF K=3 THEN 190
180 INPUT"RESPONSE TIME(SEC) ";W:GOTO 200
190 INPUT"WORD RATE(WPM) ";W
200 T1=200/C:T0=T1:T2=3*T1
210 IF K=2 T3=100*W ELSE T3=(C-W)*200/C+T2
220 IF K=1 THEN 1040 ELSE IF K=2 THEN 870
230 M$="":I=0:B=0:PRINT"ENTER TEXT -":PRINT
240 X$=INKEY$:IF X$="" THEN 240 ELSE X=ASC(X$):PRINT X$;
250 IF X=31 CLS:GOTO 230
260 IF X=62 THEN 290 ELSE IF X=91 THEN 290
270 IF X=13 I=I-1:GOTO 300 ELSE IF X=8 I=I-1:GOTO 240
280 A(I)=X:I=I+1:GOTO 240
290 A(I)=X:PRINT
300 FOR J=0 TO I:X=A(J):IF X=32 C$=" ":GOTO 850
310 B=B+1
320 IF X=44 C$="--..-- ":GOTO 850
330 IF X=62 C$=".-.-.  ":GOTO 850
340 IF X=61 C$="-...-  ":GOTO 850
350 IF X=91 C$="...-.-  ":GOTO 850
360 IF X=63 C$="..--..  ":GOTO 850
370 IF X=64 C$=".....  ":GOTO 850
380 IF X<45 THEN 840 ELSE IF X>57 THEN 410
390 X=X-44
```

```
400 ONXGOTO450,460,470,480,490,500,510,520,530,540,550,560,570
410 IF X<65 THEN 840 ELSE IF X>77 THEN 430 ELSE X=X-64
420 ONXGOTO580,590,600,610,620,630,640,650,660,670,680,690,700
430 IF X>90 THEN 840 ELSE X=X-77
440 ONXGOTO710,720,730,740,750,760,770,780,790,800,810,820,830
450 C$=".-... ":GOTO 850
460 C$=".-.-.- ":GOTO 850
470 C$="-.-. ":GOTO 850
480 C$="----- ":GOTO 850
490 C$=".---- ":GOTO 850
500 C$="..--- ":GOTO 850
510 C$="...-- ":GOTO 850
520 C$="....- ":GOTO 850
530 C$="..... ":GOTO 850
540 C$="-.... ":GOTO 850
550 C$="--... ":GOTO 850
560 C$="---.. ":GOTO 850
570 C$="----. ":GOTO 850
580 C$=".- ":GOTO 850
590 C$="-... ":GOTO 850
600 C$="-.-. ":GOTO 850
610 C$="-.. ":GOTO 850
620 C$=". ":GOTO 850
630 C$="..-. ":GOTO 850
640 C$="--. ":GOTO 850
650 C$=".... ":GOTO 850
660 C$=".. ":GOTO 850
670 C$=".--- ":GOTO 850
680 C$="-.- ":GOTO 850
690 C$=".-.. ":GOTO 850
700 C$="-- ":GOTO 850
710 C$="-. ":GOTO 850
720 C$="--- ":GOTO 850
730 C$=".--. ":GOTO 850
740 C$="--.- ":GOTO 850
750 C$=".-. ":GOTO 850
760 C$="... ":GOTO 850
770 C$="- ":GOTO 850
780 C$="..- ":GOTO 850
```

```
790 C$="... - ":GOTO 850
800 C$=". -- ":GOTO 850
810 C$="-.. - ":GOTO 850
820 C$="-. -- ":GOTO 850
830 C$="--.. ":GOTO 850
840 C$="":B=B-1
850 M$=M$+C$:IF K<>3 RETURN
860 NEXT:PRINT:PRINT B;"CHARACTERS COMPILED, ";
870 INPUT"RETURN TO TRANSMIT - ";A$:PRINT:IF K=3 THEN 900
880 X=INT(RND(0)*47)+44:IF X>57 IF X<61 THEN 880
890 Z=X:M$="":GOSUB 320:GOSUB 900:O$="":GOTO 880
900 Y=LEN(M$):FOR J=1 TO Y:A$=MID$(M$,J,1)
910 IF A$="-" A$=CHR$(95)
920 IF K<>2 PRINT A$; ELSE O$=O$+A$
930 IF A$=" " THEN 960 ELSE IF A$="." T=T1 ELSE T=T2
940 OUT 255,4:FOR L=0 TO T:NEXT:OUT 255,0
950 FOR L=0 TO T0:NEXT:NEXT
960 IF K=1 NEXT:RETURN
970 FOR L=0 TO T3:X$=INKEY$:IF X$<>"" THEN 990
980 NEXT:GOTO 1010
990 A=ASC(X$):PRINT X$;:IF A=31 CLS:O$="":GOTO 870
1000 IF A=2 PRINT"  =  ";O$;TAB(15);"CORRECT !":GOTO 1030
1010 IF K=3 NEXT:PRINT:PRINT:GOTO 230
1020 PRINT TAB(6);O$;TAB(15);"=  ";CHR$(Z)
1030 FOR L=0 TO T3:NEXT L:RETURN
1040 PRINT"ENTER CHARACTERS -":PRINT
1050 M$="":X$=INKEY$:IF X$<>"" X=ASC(X$) ELSE 1050
1060 IF X=31 CLS:GOTO 1040
1070 PRINT X$;:GOSUB 320:PRINT"  =  ";
1080 IF M$="" PRINT"INVALID CHARACTER !":GOTO 1050
1090 GOSUB 900:PRINT:GOTO 1050
```



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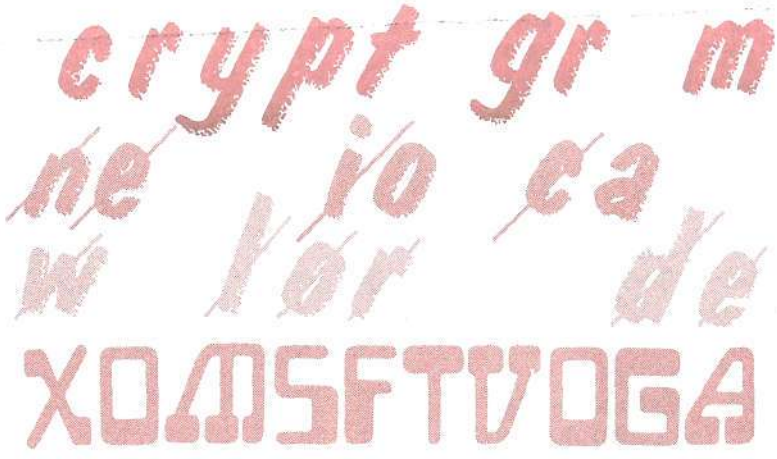

by Rik Pierce

Puzzle addicts, here's a program for you. If you've ever tried to solve a difficult cryptogram without an eraser, you'll appreciate the convenience of using the computer. And, if you've never experienced the joys of deciphering a real brain-teaser, get ready for a treat!

A cryptogram is a popular puzzle in which a quotation is encoded by a substitution cipher. In other words, for each letter in the original quote, a different letter is substituted; punctuation remains unchanged.

For example:

SAY "HELLO"

might become:

TBZ "IFMMP"

or:

QFL "DGAAR"

The object, of course, is to decipher the original quotation.

Experienced cryptographers have a number of tricks which aid them in solving a puzzle. For example, in a long quote, the frequency with which some letters occur may closely match that of the language in general (E occurs far more often than Z or Q). In order, the most common letters are E T A O I N S.

Word beginnings, endings, punctuation, and dipthongs may play a part in the decoding process. Most important, though, are short words, which can unlock the vowels in a puzzle in short order. There are only two one-letter words (I and A), and a handful of two-letter and three-letter words.

To tell you any more, though, would spoil your fun. Try one of the first few puzzles in the program's "library" if you're new at the game: they're quite simple. The expert will find tougher problems near the end, or in the evening newspaper. Either way, you'll be using space-age technology to work on puzzles that have fascinated men since the time of Shakespeare!

```
10 CLS:PRINTCHR$(23)
20 '              4/15/79
30 PRINT@330,"    CRYPTOGRAM
40 PRINT@454,"    BY RIK PIERCE
50 '              396 PACIFIC ST
60 '              BROOKLYN, N.Y. 11217
70 '              212-875-7307
80 '              VERSION 3.4
90 FOR XX=1TO1500:NEXT XX:CLS
100 PRINT@384,CHR$(23);"DO YOU WANT INSTRUCTIONS";:INPUT A$:IF L
EFT$(A$,1)="Y"GOSUB 850
110 CLS
120 CLEAR3000
130 DIMC$(300),M$(350)
140 DIM C(100),A(90),B(250)
150 Q$=CHR$(34)
160 PRINT@140,"TYPE IN CRYPTOGRAM OR A NUMBER FROM THE BANK"
170 INPUT M$:IF LEN(M$)<3 THEN BN=VAL(M$):GOTO190
180 GOTO 200
190 GOSUB 1100
200 CLS:PRINT@448,CHR$(23);:PRINT"    ASSEMBLING CRYPTOGRAM
210 M$=M$+" "
220 Y=1:0=0:X=0:L1=0
230 ' ** K=LENGTH OF CODE M$ **
240 IF LEN(M$)>142 THEN L1=32
250 FOR K=1 TO LEN(M$)+50
260   C$(K)=MID$(M$,K,1)
270   B(K)=0
280 NEXT K
290 CLS:IF L1=0 THEN PRINTCHR$(23)
300 M2$=M$
310 M1$=M$
320 X=32+L1+X:Z=32+L1
330 ' ** DETERMINE LENGTH OF EACH LINE **
340 IF C$(X)=" " THEN 370
350 X=X-1:Z=Z-1:GOTO 340
360 ' ** LE=LINE END  ** EACH LINE HAS "Z" LETTERS ** Y=LINE # *
370 LE(Y)=Z
380 K1=K-LE(Y)
390 IFLE(Y)=0 GOTO 440
```

```
400 PRINT@64+(192*(Y-1)),LEFT$(M$,LE(Y)):Y=Y+1
410 M$=RIGHT$(M1$,(LEN(M1$)-Z))
420 GOTO 310
430 '
440 '
          ** SUBSTITUTION **
450 IF F7=5 PRINT@964,"CRYPT #";BN;"...CHALLENGER!";:GOTO 480
460 IF BN>0PRINT@978,"CRYPT #";BN;
470 A$=INKEY$:A$=""
480 PRINT@896+INT(L1/2),"   CRYPT LETTER TO CHANGE?    ";
490 A$=INKEY$:IF A$="" OR A$=CHR$(13) THEN 490
500 IF A$=" "GOTO480
510 IF A$="/"FOR L=0TOY:PRINT@(192*L),CHR$(30);:NEXT L:FOR XX=1T
OK:B(XX)=0:NEXT:Q=0:GOTO480
520 IF A$="?"CLS:GOTO120
530 IF A$="N" THEN BN=BN+1:GOTO 190' * NOTE THIS IS SHIFT N *
540 PRINT@896,CHR$(30);
550 FOR XX=1TO15:NEXT XX
560 PRINT@900+INT(L1/2),"NEW LETTER FOR ";Q$;A$;Q$;" IS ?";
570 B$=INKEY$:IF B$="" OR B$=CHR$(13) THEN 570
580 PRINTCHR$(8);Q$;B$;Q$;
590 B(A(ASC(A$)))=0:IFB$=" " THEN 650
600 U=0
610 IF B(ASC(B$))<>5 THEN B(ASC(B$))=5:GOTO 650
620 PRINT@896,CHR$(30);
630 U=U+1:PRINT@910+INT(L1/2),"ALREADY IN USE   ";Q$;B$;Q$;:FOR
XX=1TO100:NEXT:PRINT@910,"                  ";:FOR XX=1TO100:NEXT:I
F U<5 GOTO 630
640 GOTO 440
650 A(ASC(A$))=ASC(B$)
660 F8=0
670 '
         ** LOOK AT EACH LETTER **
680 FOR L=1 TO Y-1
690  FOR K1=1 TO LE(L)
700   T=T+1
710    IF ASC(C$(T))<65 THEN PRINT@(192*(L-1)+R),C$(T);:GOTO 740
720    IF C$(T)<>A$ THEN GOTO 740
730    PRINT@(192*(L-1)+R),B$;:F8=5
740 IF L1<>0 THEN R=R+1:GOTO 760' L1=32 WHEN CRYPT IS VERY LONG
```

```
750 R=R+2
760 NEXT K1
770 R=0
780 NEXT L
790 IF F8=5 GOTO830
800 PRINT@896,CHR$(30);
810 B(ASC(B$))=0
820 U=U+1:PRINT@910,Q$;A$;Q$;" NOT IN CRYPT.":FOR TIME=1 TO 100:
NEXT:PRINT@916,"                ";:FOR TIME=1 TO 100:NEXT:IF U<5 G
OTO 820
830 T=0:Q=1
840 GOTO 440
850 '  ** INSTRUCTIONS **
860 CLS:PRINTCHR$(23);"         INSTRUCTIONS"
870 PRINT:PRINT"CRYPTOGRAMS ARE SIMPLE CODES IN
880 PRINT"WHICH ONE LETTER IS SUBSTITUTED
890 PRINT"FOR  ANOTHER.  THIS PROGRAM HAS
900 PRINT"A BANK  OF  CRYPTS,  SO YOU MAY
910 PRINT"TYPE  IN  EITHER  AN  ORIGINAL
920 PRINT"CRYPTOGRAM,  OR  THE  NUMBER OF
930 PRINT"ONE IN THE BANK.  AS EACH CRYPT
940 PRINT"IS DISPLAYED  YOU WILL BE ASKED
950 PRINT"WHICH LETTER TO SUBSTITUTE.  YOU
960 PRINT"THEN  TYPE  THE  LETTER  OF THE
970 PRINT"CODE YOU WANT TO  CHANGE.  NEXT
980 PRINT"TYPE  THE  LETTER  YOU  WANT TO
990 PRINT"SUBSTITUTE."
1000 GOSUB 1090
1010 PRINT"SPECIAL SYMBOLS:
1020 PRINT"WHEN ASKED WHAT LETTER TO CHANGE
1030 PRINT
1040 PRINT"  ";CHR$(34);"/";CHR$(34);". .CLEARS ALL SUBSTITUTION
S
1050 PRINT
1060 PRINT"  ";CHR$(34);"?";CHR$(34);". . . SELECTS ANOTHER CRYP
T
1070 PRINT
1080 PRINTCHR$(34);"SHIFT N";CHR$(34);" . . SELECTS NEXT CRYPT
1090 PRINT@984,"=ENTER=";:INPUT Q$:CLS:PRINTCHR$(23):RETURN
```

```
1100 ' ** BANK OF CRYPTS **
1110 IF BN>29 BN=29
1120 ON BN GOTO 1130,1150,1170,1190,1210,1230,1250,1270,1290,131
0,1330,1350,1370,1390,1410,1430,1450,1470,1490,1510,1530,1550,15
70,1590,1610,1630,1650,1670,1690
1130 M$="GK'VK YLIKZ YLLKZTKT GQKZ GK DVK ZYI MYPRIKPB YLLKVKT I
QDI GQREQ GK TYZ'I VKDPPB GDZI. "
1140 RETURN
1150 M$="PYXT BU FLT RYYW FLWYKSL ELBHL ET CYXT AWYC UTPABULQTUU
 FY UTWXBHT JQR AWYC UYPBFKRT FY JPP FLT EYWPR. "
1160 RETURN
1170 M$="HXVBB BCCBLHVFPC GS PYSB FVB CGWBHXYLN HG RG, CGWBGLB H
G PGAB, FLR XGZB SGV YWZVGABWBLH. "
1180 RETURN
1190 M$="MEK XIWEY MBZ DMBEY PUKZWLPER RM -- XIKD PGCPDA UPVK AB
ZK XIKWZ LPZA CWGG CMZV KOKE WJ XIKD RME'X. "
1200 RETURN
1210 M$="K RPPW-KZPM LPWR SBL ZBMA SPM YBMLR CMXSBJ IBRS K XKMJ
LKNBWZ: "+CHR$(34)+"IBRS KAA GN ACUP KWJ GCLR CY GN KAACIKWXP."+
CHR$(34)+" "
1220 RETURN
1230 M$="W ZXQQVZS HS OPUU ZVFS QVSFZ JYSS BSYZS LSOPXZS WA WZ S
PZWSY RWBWER AISF PHPM AIPE AYMWER AV ZSUU AISF. "
1240 RETURN
1250 M$="HTYTUVAN VH UTETY WVETU AB LH -- QPOZ QBZIBHLYT PUM MVH
QVIOVUT RPET AB JT YUMVEVMLPOON PQRVTETM. "
1260 RETURN
1270 M$="CZM XRWDYZ JVDP CILCND ORRX C IKPPIR XRXXRW KZ QKD JCOR
-VX PV AR LYWPQ QKD DCIP. "
1280 RETURN
1290 M$="PZ ATM AYFM SM NRYA SGWCMOYWK TGS GRO QTYVCOMW SYVV ARO
W GRR, SM PMKYW AG SGWCMO STMW ATMZ SYVV QGFM YW. "
1300 RETURN
1310 M$="BD'F H CBJ LBSWSPFF DX PSDMRFD FXVP EXQLF NBDK H FPIMPD
 CPIHRFP DKPG EPPQ FX BVTXMDHSD MKBQP DKPG HMP DPQQBSJ BD DX FXV
PCXWG PQFP. "
1320 RETURN
1330 M$="SYR NRBS QHIS DR RZRP NRBSKD COKG KSYRP ORKOFR HB SYLS
KI HXOPKZHGQ KCPBRFZRB. "
1340 RETURN
```

```
1350 M$="DP FNDRP PMN NKVPLRP IVNRB'P KV DGVCBI PDFELBK DWVCP VP
MNGR. "
1360 RETURN
1370 M$="XN ANTLE OLNTE DE -- GNIPNZNUMI UOP O FNE POCMI UGMX NX
FQ GNIPMP GOA DE. "
1380 RETURN
1390 M$="AMJHRBREDH HEJ IDC GRKKRID, WRUC MTDLPCL OMITHEDL ACIAK
C EPC UCPJ GTBM IUCPVCRVMO; OMCHC EPC, IW BITPHC, APCOOJ PITDL W
RYTPCH. "
1400 RETURN
1410 M$="OMYMWC, YV AV HXRVOGRHG, LVHHRNRHG, MF GAVMQMKRZO, BRQQ
 WVOC GAZG AZLLROVHH RH GAV TRFHG NMHG WVHRFZVQV GAROK RO QRTV.
RG'H BAZG BV ZQQ BZOG. "
1420 RETURN
1430 M$="OXKE PQH YLE'V NKLV 'KR LER VXKP OQE'V SKV PQH TQGE 'KR
, THWV WEHN 'KR. GV LSOLPW WHYVKKAW. "
1440 RETURN
1450 M$="Z VXZFF UWKFY, FJJEKDH ZG Z HLBZG YZDB, ZVEBY WKV TZGWB
L: "+CHR$(34)+"KV WB TJL XB JL ZX K TJL WKX?"+CHR$(34)+" "
1460 RETURN
1470 M$="RJB ACGDPH WA ZBUWHDCHM PE RDKER; PRE QCDX CVZ QWWA CDB
 OKERPHB CVZ ADBBZWU. RW ECHPPAPHB WVB UCM ZBERDWM GWRJ. "
1480 RETURN
1490 M$="KAHMPHECSW CLH JEH ILJ KBRSO CJ BOV MPHOCRJEO VEJIO HRC
LHA HTHAWCLREQ JA EJCLREQ. "
1500 RETURN
1510 M$="XABGB HAVFVH GVCTF UK B JKAZID QTI XKWVCTFZ VD CIVDC JW
BHKZ BOX UIIVDC FTVDCZ. "
1520 RETURN
1530 M$="HYFH TLRMDHTLFHQ JLKJCJKTFW SYM RQFDU VQ SJWW NQ OMLPTQ
DQK JU FNMTH OGDHFJL HM NQ KQRQFHQK. "
1540 RETURN
1550 M$="DV ZYBFW WZ HV NDNCV WFNW "+CHR$(34)+"PVOVBNWMRB NYWFZC
MWE"+CHR$(34)+" GNR HV WFV KZLW PMIOZKNWMG, CZYRPNHZYW DNE WZ IN
LL WFV HYGA. "
1560 RETURN
1570 M$="HBIKW LYW NMIKW? TLYH GBANI IKVHMIKW? HIF VKIGBYR FMPI
YKBAZNMI -- HZBV RBYW MX CLNMI TBCC NIBYA FMP HZK AIKLHKVH IKTLI
W. "
1580 RETURN
```

```
1590 M$="DZ NMG JYK XSJ L FBYH GBM CMIZ FXDM KYYJ GXFGM LS FMQMO
GLSK FQLNNMIF -- HBXG L OBYYFM, BM OBMHF GYY. "
1600 RETURN
1610 M$="VH J ZICJM HKNRCI TQ DTNCA, EJE VA OTHOCIHCE JRTKM XJIB
VHZ AXJOC, MDC BVEA JRTKM TKMCI AXJOC, JHE NTMDCI JRTKM OPTACM A
XJOC. "
1620 RETURN
1630 M$="IW IGMPA JFDMGPD MP KPG LKLGPD KR FPAGU, BG LFW KRDGP G
VTFJG WGFUV KR UGAUGD. "
1640 RETURN
1650 M$=CHR$(34)+"CDD QR BCSWYDR EPHHBHHLPFH KPS C ESBTLPVH QPQB
FW PK WLQB,"+CHR$(34)+" NBSB WYB DCHW SBTPSUBU NPSUH VWWBSBU JR
XVB8F BDLGCJBWY WYB KLSHW. "
1660 RETURN
1670 M$="NGHES, PGU GZ PGHS, QA ADW UZGEV ARIW QES MPQXW RN EGRN
W QES QA ADW ZRVDA ARIW QES MPQXW RN MPWQNQEA IHNRX. "
1680 RETURN
1690 M$="XFRT XPBNXMLHLCRBXH JBNLHXP DVMXPWNJ XVBRMVW XPWRGXBWJ
TDPRVC XPTDLDJ MUBXFXWRLVJ. "
1700 RETURN
```


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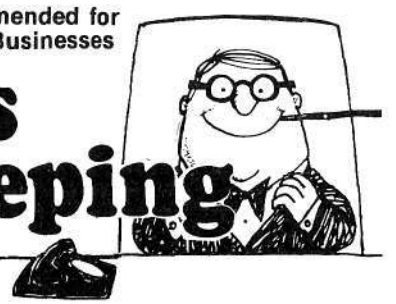

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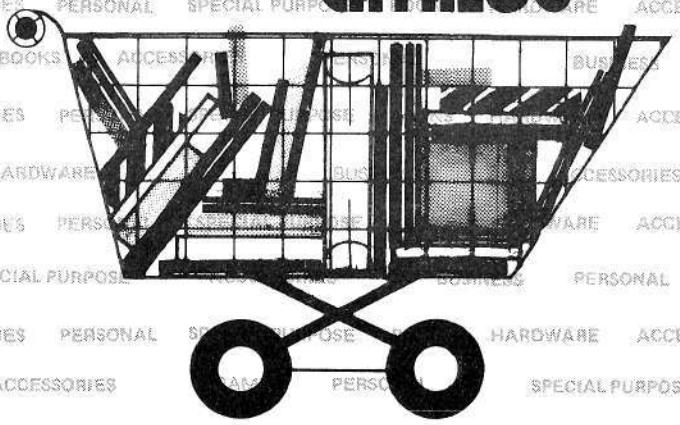

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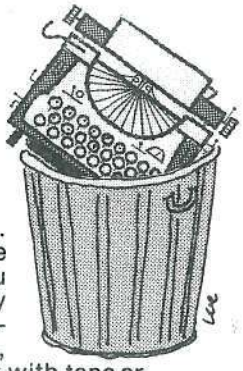

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